For erecting two cottages, for Mr. A. Brown, at Orpington, Kent. Mr. G. St. Pierre Harris, architect:—

Winter	£750 0 0
Treadwell	698 0 0
Wright	655 0 0
Haisman (accepted)	585 0 0

For alterations and additions to No. 55, Addington-street, Ramsgate. Messrs. Hinds & Son, architects:—

Goodman	£175 0 0
Miller	145 0 0
Elgar	140 0 0
Duckett	130 0 0
Port	118 10 0
Crickett (accepted)	106 10 0

For building new church at Weelsby, Grimsby, for Mr. E. Heneage, M.P. Mr. Withers, architect. Quantities by Mr. Poland:—

Booth & Son, London	£7,375 0 0
Dove Bros., London	7,270 0 0
Clark & Son, Louth	7,270 0 0
Haywood, Grimsby	6,862 0 0
Loughton, Grimsby	6,457 0 0
Doughty, Grimsby	6,189 0 0
Close, Lincoln	6,141 0 0
Snowden, Grimsby	6,068 0 0
Tophany, Grimsby	5,725 0 0
Riggall & Hewins, Grimsby	5,671 0 0

For walls, roads, paths, &c., Greenbank Cemetery Extension, Bristol:—

Parfitt, Stapleton-road	£2,718 16 0
Shellard, St. Philips	1,778 10 0
Baker & Son, Canon's Marsh	1,760 0 0
Fugill, Stapleton-road	1,590 0 0
Pugsley, Clifton	1,448 0 0
Hatherley, Stokes Croft	1,398 0 0
Eastabrook & Son, Pennywell-road	1,385 0 0
Beven, Bedminster	1,339 0 0
Yalland, Fishponds	1,325 0 0
Clark, Fishponds	1,310 0 0
Deals, Maudlin-street	1,294 0 0
Cowlin & Son, Brunswick-square	1,190 0 0
Parker, Stapleton	1,154 0 0
Monks, Fishponds (accepted)	1,145 0 0

For decorating Foresters' Hall, Clerkenwell-road, E.C.:—

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Ansell	875 0 0
Garrad	783 0 0
Pashley, Newton, & Young	777 0 0
Coombes	515 15 0
Taylor & Sons	491 0 0
Howe	475 0 0
Steel	450 0 0
Allard	446 0 0
King	438 0 0
De Jong	429 0 0
Patten	368 0 0
G. & J. Mason	360 0 0
Hadlow & Son (accepted)	353 0 0

For a pair of cottages at Crowborough Warren, Withyham, Sussex, for Mr. James Ramsbotham. Mr. Charles Edwards, architect:—

Harman	£475 19 6
Parker	374 0 0
Waters	369 0 0
Goldsmith	355 4 0
Mackellow & Son	348 10 0
Paine (accepted)	336 5 0

For greenhouses and garden-walls at Swindon. Mr. T. S. Lansdown, architect:—

	Greenhouse.	Walls.
Lascelles, London	£367 0	£215 9
Helliwell, Brighouse	370 0	...
Blandford, Swindon	385 0	140 0
Wiltshire, Swindon	335 0	125 0
Barrett, Swindon	325 2	125 16
Henley, Swindon	306 6	135 0

For house and stables at Swindon, for Mr. J. C. Townsend. Mr. T. S. Lansdown, architect. Quantities by the architect:—

Marshall, Southwick	£6,093 0 0
Kimberley, Banbury	5,100 0 0
King, Gloucester	4,985 0 0
Crowe, Hereford	4,893 0 0
Jones, Gloucester	4,678 0 0
Wiltshire, Swindon	4,666 0 0
Phillips, Swindon	4,583 0 0
Barrett, Swindon (accepted)	4,025 0 0

For new galleries, painting, &c., Parson's-hill Baptist Chapel, Woolwich. Mr. M. L. Saunders, architect:—

Sabey & Son	£698 0 0
Jerrard	593 0 0
Taylor	576 0 0
Staines & Son	528 0 0

For construction of roads and drainage on Uplands Estate, Romford, for Messrs. H. & P. H. Betts. Mr. E. C. Allam, surveyor:—

White	£760 0 0
Pound	653 0 0
Tremling	640 0 0
Cutting	630 18 0
Philbey (accepted)	555 0 0

Accepted for East Grinstead Gas and Water Company:—

Contract No. 1.—Messrs. Cochrane, Grovet, & Co.
Contract No. 2. —Mr. J. Tooth, East Grinstead.
Contract No. 3.—Mr. G. Beard, East Grinstead.
Contract No. 4.—Mr. J. May, 259, High Holborn.

St. Paul's Church, Brixton.—Mr. William Downs writes to say that the amount of his tender was 9,775*l.*, not 12,000*l.*

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M. B. (the gentleman addressed has nothing to do with the *Builder*, and never has had the slightest connexion with it).—J. W.—F. R. A.—F. & B.—F. M.—N. & Co.—D. K. & Son.—W. D.—J. D. H.—R. H. C.—W.—M. W.—J. J.—J. B.—T. F. C.—T. P. & Co.—H. C.—J. H.—O. & R.—C. B.—D. & Co.—W. H. W.—G. W.—M. H.—J. C. R.—T. O.—W. H. J.—H. T.—A. M.—G. B.—T. D —H. M.—Mrs. F.—F. A. (shall be considered).—M. H. J. (too late).—J. P. (in type) —H. E.

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The Builder.

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Lions and Eagles.

NO other animals of lofty type have been so much used as symbols as the lion and the eagle. They have appeared as emblems of bravery from the earliest times, in prose and verse, in heraldry and art. Their valour has been associated with dignity and magnanimity,—rarely with ferocity, and never with cruelty. The lion is the eagle of the earth, and the eagle the lion of the air.

When the more pitiless qualities sometimes found in fighting natures were sought to be expressed, they were set forth, not in them, but in their demoniac relatives, the tiger, and the vulture, who in like manner have a fanciful parity and distinction between themselves, inasmuch also as the vulture may be looked on as the tiger of the air, and the tiger as the vulture of earth. And yet, perhaps, they are not so very different, in disposition and acts, from the above pair as may be often thought, but it is the way of the world. "Give a dog a bad name, and hang him," is an adage of wide acceptation; and thus tigers and vultures have ever been in the utmost ill-repute for bloodthirsty monsters, while their near relations have been raised to a far superior level, and, in symbolism, art, and heraldry, have kept the best company.

For the vulture, on non-poetic but useful grounds, there appears to be a good deal to be said; for, with the exception of the lammergyer and the condor, he does not seem to exult in killing for its own sake, but has no objection to waiting in a lordly way for its being done for him, and appears to have advanced ideas as to the very high state in which it may be devoured, on which occasions his operations become a boon to man. There seems, however, nothing to be alleged in favour of that very magnificent but fearful creature, the royal Bengal tiger. It causes, indeed, a reasonable shudder when we read the statistics of human life annually sacrificed, in India, to this sanguinary beast.

The lion, however, occupies quite a different position in our eyes. The common feeling about a lion is more that he is a sort of magnificent dog than a creature belonging to the feline race at all. In respect to our own British lion we look on him as England's great house-dog,—one who wags his tail more in welcome than in anger, and whose roar is only a superb bark. The lion, indeed, for his reputation and renown, seems much indebted to his voice. He puts his mouth down to the ground and roars, and the earth trembles, and every creature for miles around is affrighted. He lifts his grand head and roars again, and it is as if it thundered. He is a kind of Jove among beasts.

And yet he is only a cat,—a tawny Tom on a grand scale; as truly a cat as the "chattan" that yet lingers in our Scottish forests, or our own domestic Tabby, who dozes her days away before our fire, and washes her face and hands in token of rain.

The muzzle of the lion is somewhat longer than that of the tiger; but in other respects it is more his mane and voice which distinguish him from the other feline creatures than his structure. Their skeletons are almost exactly similar. Shave an Indian tiger and an African lion, and there would not be more difference in form than exists between the Asiatic and African elephant. And yet we would desire by all means to retain uninjured our respect for lions; for, indeed, as a late statesman and philosopher said,—"What should we be without our superstitions?"

There are many delightful stories about lions,—such as that of Androcles, and how the king of beasts always protected pure maidens,—Spenser's Una, for instance; and, indeed, it is quite out of the question to bate one iota of our belief in his magnanimity, forbearance, and respect for virtue. Poetry could not afford it, for one of her brightest gems of illustration would fall from her diadem. Moreover, we have come to look on him, not at all as a wild beast, but as one faithfully and permanently associated with the regal and fair sovereignty of these isles, over which he keeps watch and ward, like some majestic supernatural mastiff, somewhat of the stout St. Bernard breed, vastly magnified.

The British lion, indeed, by the force of civilisation and of keeping good company, appears soothed and softened to this character. And it is in this phase that he is represented in the four gigantic versions which do duty in Trafalgar-square, guarding that central spot of London which the late Sir Robert Peel said was the finest site in Europe. There they crouch as sentinels, with all the characteristic gentleness of giants, regarding, with benign aspect, alike the crowd of day and the solitude of night, and having the assurance depicted in their visages that they never have done, nor ever would do, harm to anybody.

Thus do they ample credit to the instinct of the great painter who laid down his brush to take up the modelling tool, to fashion them of such a type as would meet the occasion, and give satisfaction to the Queen and country.

They truly are grand emblems, but to do full justice to the expression of their visages the original models of their heads should be seen, as we saw them not very long ago, as great busts, at the residence of the eldest of the three gifted brothers, Edwin, Charles, and Thomas, who now, alas! have all passed away personally from among us, but whose memories remain and will long be cherished. Two of these grand leonine busts, being distinct full-sized studies for the heads of these fine colossi, were to be seen in a conservatory in the grounds of the late Mr. Thomas Landseer's residence in St. John's Wood. These models are of lions of somewhat different ages. The elder one, after some delay and weighing of merits, having been adopted to form the original for the four members of the *parti carré* in Trafalgar-square.

The three brothers Landseer were extremely attached to each other, and Thomas, who was the survivor, especially adored his youngest brother Edwin, and was engaged in etching and engraving some of his productions until close upon the time of his own decease, and it was but shortly before this that we had the opportunity of visiting and examining these two great busts. And how lovingly did Tom Landseer,—everybody called him Tom,—descant on their beauties, and draw us to the best point at which to contemplate them!

Grand and true to nature as their general form is, it was evident that much of their charm arose from the same artistic quality which gave such interest, reality, grace, and satisfaction to the great artist's easel pictures of animals, namely, his marvellous felicity in representing texture. The character of skin and the wave of hair was hit off by him to perfection, as if by instinct, and this attribute, all unused as Sir Edwin was to the use of the modelling tool, informed his plastic work as it had done so eminently his achievements on canvas. The speciality of touch which effected this could not be translated into metal so well by the usual process of fire casting as by the more delicate and exact rendering of electro-deposit. In fact, this delicacy of surface is scarcely to be traced in the fire-castings in Trafalgar-square. And thus we ventured to suggest to his brother that at least these two great busts of the lion should be preserved to the nation in all their *finesse* and perfection by being copied from these original plaster casts by the more delicate and exact process. Whether any steps were taken before his decease to have this done we are not aware; but, at the time, he accepted our suggestion as one worthy of his brother's fame, and if it has not as yet been realised, we venture to repeat it in our columns as a reasonable idea.

There are grounds for wishing that the bronze castings in the square were more exact in detail, but, at any rate, in their large contours we are presented with one type of the lion,—the mighty and benevolent British lion,—well conceived and broadly wrought out. It may be recognised that the heads are the most excellent portions of them, the rest of the form not being of equal merit; but altogether we must acknowledge that they are noble colossi, vast, powerful, and placid, and, although grave, as amiable as puppies at play.

If we desire to see our national supporter represented in another mood, angry, terrible, and threatening, we may not perhaps do better than turn to our historic as well as comic contemporary, *Punch*, and consult the cartoons of Tenniel, who has adopted nearly the same type of lion, but, in some of his fine illustrations, has

shown him bristling with noble rage, and indicating that, quiet as he is, he is not altogether to be trifled with. Also, there are designs of Sir Edwin Landseer, while he was a young man, of groups of lions and lionesses and other animals, which were afterwards etched by his brother, which are full of truth, action, and vigour. In their youth, while the brothers were students under the enthusiastic B. R. Haydon, they anatomised a dead lion, and made studies from their dissections, and thus were well grounded in their representation of the animal. So that the great painter had, early in life, his attention addressed to the delineation of the creature, which, colossal in bronze, was thereafter to be one of his latest works as his conception of our national emblematic type of power and resolution.

We speak of this type of lion, as there are several varieties which exist even in nature. The foremost of these, in the pages of our histories of quadrupeds, is the formidable South African lion, with his black mane, which is not fully developed till the third year; next to which comes, in fierce reputation, the lion of Algeria and Barbary. The lion of Western Africa is considered by some authorities as a distinct species, and has been called the Gambian lion; while also the ancient Nubian lion had probably some difference of character, as it furnished the old Egyptian artists with the models for their sculptured lions, which have some points of distinction from any variety existing. The lion of Asia presents also some diversities, which are to be recognised, transferred to stone, in the ancient *rilievi* from Nineveh; and the natural history of Guzerat presents us with one which is nearly maneless. In all these varieties the lioness has a somewhat shorter and broader face than her liege lord.

On these varieties those of art have been formed, and in some cases it is evident that either lions with short manes have formed the models, or that these have been reduced in translation into art, so as to display, more freely and to advantage, the powerful proportions of the great foreheads of these magnificent beasts. This may be especially noticed in the very majestic pair of granite lions in the Egyptian Hall of the British Museum, which, whatever may be their shortcomings in the minor details of nature, have a dignity and solemn grandeur in their aspect and breadth of treatment which leave nothing on that score to be desired.

The ancient Egyptian fashion of art was something quite of itself, engrained on the national character, and inherited by age from age. Consecrated by precedent, and upheld by the priesthood, it would possibly have cost the artist's life if he had departed from it. It was a slavery of art; but it led to mystic and impressive results. This method grasped grand characteristics with keen power, but swept aside minor details as too mundane and familiar. This may be remarked in everything they did in art. All was massive and broad, and eternal as they could make it. In their lighter paintings of animals and birds, instinct with truth and characteristic as they are, they are coerced by a precise conventionality, which sought to represent as much as possible by the simplest and most concentrated method; and these two grand recumbent lions in the British Museum partake fully of these qualities of ancient Egyptian art.

They are just at the opposite pole of representations of the lion to those which are afforded by the British lions of Sir Edwin Landseer. Which are the best? is a question not necessary to be concluded. It may be acknowledged, however, that the ancient examples have the one great point in their favour, that so much is left to the imagination. They contain but few details to criticise, and their impress is full and broad on the spectator without any disturbance of that kind.

Fine types are they both of the lion, and very glad are we to be able to claim one of them as English, for, in our public monuments especially, are to be seen some which are comic rather than grand, and have been said to be more like old gentlemen in wigs than representations of the King of Beasts. St. Paul's Cathedral, Westminster Abbey, and Guildhall are not without examples of these grotesque inventions, in which the elaboration of the manes and tails seems to have been relied on to compensate for deficiencies in other respects.

One of the best lions in statuary of modern times is the colossal one hewn out of the rock at Lucerne after the model by Thorwaldsen, which appears to have been studied with a true knowledge of the animal, and is, moreover, in a novel and expressive attitude. The lions of Canova, on the other hand, in St. Peter's, afford a remarkable instance of the power of genius and inventive skill in investing untruthfulness of structure with much of the impression of veracity. They are assuredly very fine in impress, but this is combined with anatomy so faulty that one can scarcely fancy that the artist had ever seen a real live lion; and that in lieu of this had been obliged to invent, as schoolboys say, something out of his own head.

The same remark may be made in regard to the lions from Asia Minor in the British Museum, with this difference, that these last appear to be good in no respect whatever; which is the more unaccountable, inasmuch as lions were not so very far to go for in that country at that time. One can only regret, indeed, that such fine blocks of marble were wasted on them, for they appear mostly to be in Parian of the finest quality. Were it not for their archæological value, the best use for them would be to dedicate their precious material to epic and poetic sculpture of the present day.

Assyria, certainly, was some way off, although there were no impossible boundaries between the countries; but there the lions of art, as displayed in the stores of the Assyrian basement-room in the British Museum, are full of truth, character, and vigour of form in every variety of attitude. The *rilievi* containing these consist chiefly of hunting scenes, in which lions and lionesses are exhibited in all the accidents of the chase, in the ferocity of attack, the struggle of combat, and the agonies of death; and the poor creatures are quite Homeric in the variety of their wounds and lethal disasters. There is one lioness in particular which excites especial pity. She is pierced with two arrows through the back from the hand of a truculent tyrant, said to be Sardanapalus, who is shown as hunting in a chariot. Alas! poor queen of the forest! Paralysed by the double wound and screaming with pain, she is dragging her hind-quarters helplessly behind her; and is represented with an evident fidelity to nature which could not have been reached by the artist unless he had been an eye-witness of this especial royal sport.

These lions must be acknowledged to be portrayed with remarkable power; but the Assyrians addressed great attention to these animals as expressions of force, and, gifting them with the human head to represent wisdom, and with the eagle's wings to express speed and wide dominion, thereby created a composite symbolic creature of the widest grasp and potency, as a significant emblem of power and empire. And thus these images appear frequently repeated, hewn as supporters, in the massive walls of the basement story of their palaces; alternating with other composite animals in which the bull takes the place of the lion, which were possibly intended to present the civil as contrasted with the military character.

The Egyptians, in whose mystic scheme of art composite creatures hold a distinguished place, not being an aggressive race, but, rather in their spirit contented with the development of their power in the great valley of their sacred Nile, did not gift their union of the human head and the lion's body and limbs with wings. Their sphinx was the representation of wisdom and force in tranquillity, not of ambition restless with the lust of extended conquest. The steadfastness of placid dominion appears to have been the character of ancient Egypt for many centuries, of which the memory seems still lingering in the scarred remains of the hugest statue in the world, the sphinx of the Pyramids.

Thus to the Assyrians belonged the union of this symbol with the expression of speed of flight in the wings of the dominant creature of the air. And this triad idea was magnificent, however marred in execution, in their block sculpture, by the conventionalisms of their art, as displayed in the elaborate tonsorial treatment of the hair and beards of their men, the bloated exaggeration of their muscles, and the simpering character of the faces. The Greeks adopted the same combination, although scarcely with so emblematic an intention, as they associated it rather with mystery than with power and empire, but they made "a thing of beauty" of it, as they did of everything they touched.

This composite creature, the winged sphinx, thus brings together the two parts of our theme, and also illustrates how the lion and the eagle, as the greatest in their respective regions, were, in art, and as historic emblems, conjoined with the intellect and supremacy of man. And having thus said a few words about the king of the forest, we may now turn our attention, for a short time, to the monarch of the air.

OBSTRUCTION OR POLLUTION: THE QUESTION OF THE THAMES.

The Thames Conservators have been utterly worsted in their contest with the Metropolitan Board of Works, as will have been gathered by our readers from the award published in our last number. That such would be the determination of the issue that the Conservators elected to raise was not difficult to foresee. Our own warnings on the subject were explicit. It is one thing to have right on our side, and quite another thing to have victory. Apart from the well-known importance of the bigness of battalions in securing victory, the effect of generalship, for the most part, turns the scale. It is rarely the case that tactical excellence, even when joined to the courage and devotion of troops, can make up for the defects of a strategic misconception of a campaign. This is what has now occurred. The Conservators chose their own field of battle, and they chose precisely that field which was most disadvantageous to themselves. The conclusion was foregone.

By the Act xx. & xxi. Victoria, cap. 147, the actual Board of Conservators of the Thames was duly appointed. By the 98th clause of that Act, they were "authorised and empowered," "from time to time, as occasion may arise, to dredge, cleanse, and scour the river Thames," and to "abate and remove, or cause to be abated and removed, all impediments, obstructions, and annoyances, and all nuisances and abuses whatever, within the river Thames." By the 102nd clause of the same Act every person who should "allow any offensive matter to flow into the river Thames shall forfeit for every such offence any sum not exceeding twenty pounds." By the 52nd clause of the Act xxvii. & xxviii. Victoria, cap. 113, the Conservators are directed as follows:—"The Conservators shall cause the surface of the river Thames to be (as far as is reasonably practicable) effectually scavenged, in order to the removal therefrom of substances liable to putrefaction." By clause 63 of the same Act, it is declared to be unlawful to open into the Thames any sewer, drain, pipe, or channel, with intent or in order thereby to provide for the flow or passage of sewage, or of any other offensive or injurious matter. Three clauses follow prohibiting the influx of sewage into any part of the river Thames, or of any contributory within three miles of the river. Clauses 64 to 67 provide for dealing with persons who pollute the river as guilty of misdemeanour. By clause 7 of the Act 33 and 34 Victoria, cap. 149, the powers of the Conservators were enlarged, and the limit for preventing the influx of sewage was extended from three to five miles from the river, and "from the eastern boundary of the metropolis" (by clause 18) "to Yantlet Creek." In clause 21 of this Act is a provision for arbitration of any difference which may arise between the Metropolitan Board of Works and the Conservators as to anything to be done by the Board of Works *under the provisions of this Act*, and the rights and privileges of the Metropolitan Board are reserved under clause 42 of the same Act.

We are not about to offer any legal argument on the above citations of the Acts of Parliament establishing the Board of Conservators. We only wish to point out that that body was constituted in order to attend to two points—the navigability and the purity of the Thames. As a temporary measure,— although the powers were not adequately limited,—the Metropolitan Board of Works were allowed by Parliament to throw their sewage into the Thames, subject to certain conditions, which,—at least, such is the contention of the advocates of the purity of rivers, —have not been carried out. It was thus open to the Thames Conservators either to apply for arbitration on the ground of obstruction to navigation, or to take such steps as they might be advised in order to put a stop to the pollution of the Thames *within the metropolis*.

As to the first step, we long since pointed out that the onus of proof would lie on the Conservators, and that it would be extremely difficult to show that they had any case against the Metropolitan Board, for the following reason. The action of the Conservators has effected, and is effecting, a steady improvement in the navigable character of the Thames. In face of

this it must be extremely difficult to prove any obstruction, as the most that could be urged would probably only be a hindering of further improvement. And so correct has this anticipation proved to be, that even the arbitrator appointed by the Conservators has given up the case. It could not well have been otherwise; and it is a misfortune in every way that the Conservators, although warned, persisted in fighting a losing battle.

With regard to the other part of the matter, the case is entirely different. We do not now speak of legal technicalities. Our whole course of legislation as to sanitary matters during the last quarter of a century has been either right or wrong. If wrong, great cost has been unnecessarily incurred by the country, and the least that can be done is to put a stop to all public expenditure for sanitary purposes of the kind without further delay. If right, it is a scandal to our legislation that while river pollution, in principle, is prohibited, its perpetration should be exceptionally legalised in the very spot in which it is at once most wholesale and most dangerous. As to this, as far as can be indicated by the precedents to which on former occasions we have called attention, the tribunals would have done justice to the reclamations of the Conservators of the Thames. If the tribunals had declared their own incompetence to do so, in face of the exceptional character of the legislation as to the drainage of London, there would have been a good ground on which to appeal to Parliament. Whatever be by chance the exact state of the law in this matter, there can be no question as to the fact. River pollution either is or is not an evil and a terrible danger. If it is not, let us be set at rest on the subject at once. If it is, why is the metropolis to be exposed to a source of danger from which we are steadily endeavouring to free less important towns?

It will be seen that the award is closely limited to the definite questions raised, and that these are purely of a hydrographic, and not at all of a sanitary, character. First it is declared that the Barking and Half-way reaches are now better for navigation than they were before the outfalls were opened. Secondly, the three banks existing in these reaches are attributed to the dredging operations carried on by the Conservators. Thirdly, the amount of matter suspended in the tidal portion of the Thames is said to be derived from several sources, of which the quantity contributed by the sewers of the Metropolitan Board is small in proportion. Fourthly, while the metropolitan sewage has contributed, in that proportion, to the formation of the banks complained of, they cannot be said, "in the sense of the Act of 1870," to have arisen from the flow of sewage. Lastly, each party to bear their own costs, and to pay half of the cost of the award.

Of these clauses, the first is one which we anticipated, from all the facts which we were able to ascertain, was a conclusion at which any impartial investigator would arrive. It is not quite intelligible to us, however, in what way the second clause is to be reconciled with the first. It seems to be a very grave impeachment on the skill of the professional men employed by the Conservators to say that their operations, which have improved the navigability of the reaches, have at the same time been so conducted as to cause shoals. No doubt we shall hear further on this matter. The statement will not commend itself to the good sense of the public as it stands. As to the third clause, looking at it from a sanitary point of view, it can hardly be deduced from it that the sewage matter which is admitted to pollute the Thames, far within the limit of the metropolis, is rendered any the less offensive or dangerous from the fact that the water of the river also contains mud from other sources. Finally, the interpretation of "the sense of the Act of 1870" rests on the responsibility of the arbitrators. We have no grounds for questioning the correctness of their judgment, on this point, on the evidence brought before them. But we must again call attention to the manner in which,—not at all, we admit, by the act of the arbitrators,—the points of vital interest to London have been not only kept out of sight during this long debate, but rendered less easy of redress than was the case before the Conservators made statements, which they have been unable to substantiate, as to the material obstacles created by the sewage deposit in a channel which they were steadily improving by their own dredging operations.

It will not increase the public sympathy with the Conservators of the Thames to observe that they declined to pay their share of the costs, so as to take up the award. No economy was effected by this hesitation, which was hardly worthy of the dignity of the Board. It remains to be seen whether the Conservators of the Thames, having shown that their care of the navigability of the river has been more effective in improving its channel than a definite daily deposit of matter from the London sewers has been in obstructing the same, will now regard the other part of their duty, and raise the question of the pollution of the river, within the metropolis, on the ascending tide.

BOILER EXPLOSIONS.

THE remarks which we made in a recent number of the *Builder*, on the discrepancy existing between the theory and practice of inspection, applied principally to the case of structures in the safety of which the public, and more especially the travelling public, are directly interested.

Compulsory and official inspection has hitherto been almost wholly confined to those productions of private enterprise in which the lives of the general community are implicated, because it is only in this direction that sufficient pressure has been exercised by the necessities of modern life. An exception has recently occurred in the legislation which was brought about by the heroic exertions of Mr. Plimsoll. There is no doubt that he would have found his self-imposed task much easier if he had confined his proposals, with regard to load-lines, to ships that carried passenger certificates. He would have had many precedents to refer to with regard to the principle involved, and in the class of shipowners with whom he would have had to deal there would have probably been found comparatively few to whom the safety of human life was not a strong, if not an overwhelming, consideration. The great practical difficulties which confronted him were similar to those that would probably require to be encountered by any one who proposed to introduce a measure with the same objects in view relating to boilers.

Leaving out of the question altogether the interference of the Board of Trade in matters connected with sea-going machinery, there is a strong analogy between the cases of ships and stationary steam-boilers. Nearly everything that has been done for the safety of both has risen directly out of the money interests of their owners. Insurance has done for the one what it is now doing for the other. The risk incurred from the necessity of having to encounter the winds and the waves made it desirable that shipowners and merchants, with their fortunes embarked in a few vessels, should have the opportunity of taking advantage of a general average, with a certain margin based upon experience in favour of those who undertook the guarantee. Hence the system of marine insurance known as under-writing. As risks of this sort vary greatly according to the character and efficiency of the apparatus which is provided to encounter them, the men who owned the most seaworthy ships had either to pay for the losses incurred by those who neglected the necessary precautions against accidents, or required to give some security that the particular vessel which they were insuring had exceptional qualities, that entitled them to the payment of a smaller premium. It was from considerations of this sort that a system of inspection was begun, out of which has grown the well-known institution known as Lloyd's. Rules were laid down, and the best scientific advice was formulated in the shape of tables of scantlings which applied to vessels of all dimensions. The effects of age and wear and tear were embodied in a system of classification by which a ship was removed from one group to another, and in which it was necessary to pay an additional premium, according to the increasing risks arising from a decreasing efficiency.

So far the system was one that was wholly identified with the money interests of those concerned, and even in the case of passenger sailing-ships, the position which a vessel held at Lloyd's was generally held to be quite sufficient as regards her sea-going qualities. The regulations of the Board of Trade for the most part applied only to the machinery of steamships, and to the accommodation provided for the passengers and crew. In laying down rules for the latter, the Legislature took a step that became a precedent for interfering on behalf of the lives of sailors, as well as for doing something to insure a fair amount of breathing-room in the forecastle or deck-house. We do not remember the exact nature of the arguments which were used by the shipowners against the proposals of Mr. Plimsoll, but no doubt freedom of contract was one that was frequently employed. Put in a few words, this amounted to maintaining the affirmative of the proposition that if a seaman chose to be drowned there was no one who had a right to prevent him. If he had to support himself, and a wife and family, and discovered in the necessities of his position a stronger inducement than a regard for his own safety, for voluntarily signing his papers and joining the crew of a floating coffin, this was held to be no business of the Legislature. Now that the reform has been accomplished, and the white circle and short thick line on the side of every ship that sails under the British flag have become the sailor's friend, showing the point to which a vessel may be loaded with safety, one cannot but wonder that any men could have been found to argue against such a reasonable requirement.

Turning now to the case of stationary steam-boilers, we find that not only is there an analogy to be discovered between them and ships with regard to the general question of risks, but that they have much in common as regards the methods of providing against them. What a vessel has to encounter in worn plates and bad rivets, a boiler has to provide against as well. Time affects both, especially in the case of iron ships in a similar manner. The special dangers to which boilers are subject, with regard to low water, faulty safety-valves, unreliable steam-gauges, the weakening effects of contraction and expansion on particular parts of the structure, and many other causes of failure which have come to light in the long list of accidental explosions, are all of a nature which render them applicable to the principles of insurance. Accordingly we find that just as capitalists were willing to undertake the risks that are inherent to navigation,—so long as there was a fair margin of profit to be gained by the venture,—so in the case of steam-boilers, they have combined together with similar objects in view. In the same way also the persons who are directly implicated in the losses attending upon accidents, as owners of boilers, have shown a willingness to insure themselves by the payment of reasonable premiums. So far the system has not been by any means so universally adopted as in the case of shipping.

There are several reasons why the one class of insurance especially connected with ships should have acquired a position of importance far in excess of that which relates to the use of steam. In the first place, the one interest is much older than the other. It would be difficult to go back to a period in the history of navigation when a system of insurance of some sort had no existence. Even in writing off a certain portion of his profits against the losses arising from disasters at sea, the shipowner instituted a kind of insurance on his own account. Among the great shipowning companies of the present day such a system is by no means uncommon, and those who carry it into practice are spoken of as "insuring themselves." The steam boiler is a thing of yesterday as compared with the apparatus of a floating vessel. Ships are not only discovered among the earliest records of civilisation, but in some form or other are found to have formed a feature in the life of prehistoric communities. The gigantic system of marine insurance which now prevails may be said to have been the growth, not of centuries, but of ages. It is hardly, then, a matter of wonder if the comparatively novel apparatus of a steam-boiler should not yet have become part of a system of similar magnitude. But there are other reasons than those connected with the antiquity of the interests involved. The amount of money tied up in the fortunes of a ship and her cargo are far greater than the price of many boilers. In the one case the whole wealth of a merchant whose interests are uninsured may go to the bottom of the sea; while in the other, even in the case of a disastrous explosion, there would, at least, be something left for a new start. The discrepancy between the magnitude of the interests involved may account for the comparatively slow growth of the practice of insurance among the men who are interested in the smaller class of risks. But besides the two reasons referred

to, there has been another influence at work in promoting the almost universal spread of marine insurance in the intrinsically greater risk involved. Experience leads us to suppose that at intervals, fortunately rare, the force of the wind at sea is sufficient to upset every calculation both of the ship-builder and the navigator. It is not so in the case of a boiler. An intelligent steam user, by complying with the laws of nature, which are necessary elements in the problem of safety, may reduce his risk so that it may reach a point at which it practically disappears altogether. As a matter of fact, also, the proportion of accidents to the numbers of the apparatus that are at work is very small as compared with the case of shipping. In all this we discover the reasons why insurance of steam-boilers is comparatively rare.

If there were no other considerations than money interests involved, it is not likely that boiler insurance would have taken any hold upon the industrial community at all. As it is, the profits to be obtained by those who undertake the risks have probably had more to do with its adoption than anything else. The system has been "pushed" by those who have had an interest in doing so, and so far it must be admitted that nothing but good has come from its adoption. It still remains an open question whether the growth of inspection under the efforts of private enterprise will do for boilers what marine insurance has done for ships, as in the case of Lloyd's, or whether, in the interests of those employed in the neighbourhood of steam boilers, it will be found necessary for the Legislature to step in, as it did in the case of our sailors, and do something for the protection of their lives.

Of the advantages to be obtained from a connexion with a good Boiler Insurance Company there can be no manner of doubt. There is only one feature of the system which occurs to us as in any way objectionable, and that is one which is so inherent to the very principle of inspections that it cannot be held to be a practical obstacle. It is the tendency on the part of workmen and others to rely on inspection to the exclusion of ordinary precautions. This over-readiness to take matters on trust would, of course, occur whether the inspection had been carried out under the auspices of a Government department, or on the part of a private company.

We fear that false notions of security must have had something to do with the terrible catastrophe which recently occurred at Walsall. No doubt, every exertion will be made to discover the immediate cause of the disaster, but whatever it may have been, it will be an unfortunate event for the future if it has the effect of shaking the public confidence in the value of those insurance companies which have already done much to spead practical and useful information among the users of steam-boilers, and which have hitherto been able to boast of a remarkable immunity from accidents among those who have carried out their instructions.

Besides the insurance against loss which a steam user enjoys by the payment of a small premium, there are other advantages to be obtained by his connexion with the institutions that have made a speciality of this class of business. Their inspectors, as a rule, are not only able from their experience to give advice as to the management of the boiler, but, being engineers by profession, are capable of advising with regard to the engine as well. The waste of fuel that goes on through the length and breadth of the country in the conversion of water into steam is altogether incalculable. As a mere source of loss this extravagance is bad enough in itself, but looked upon as an unnecessary drain upon the supplies of coal, upon which our future as an industrial community depends, it is not by any means confined to the interests of the individuals more immediately concerned in it. We have stated that the waste is incalculable. It would probably be within the mark to say that fifty per cent. of the coal used in this country for raising steam is wasted, not in the sense of half of its theoretical heat being lost, but in the sense of fifty per cent. of what is quite easy to take advantage of in practice, being thrown away by the use of inefficient engines and boilers. As matters stand at present, fully seven-eighths or more nearly nine-tenths of the theoretical force of a pound of coal is lost even in the best steam-engines. The failure of science to obtain more economical results is bad enough from the point of view of saving our national sources of energy; but such matters are limited by the state of our knowledge, and so long as efforts are made to effect a further economy there is nothing more to be done. It is different, however, in the ordinary practice of steam using. When we know that manufacturers can obtain their energy without any difficulty at the rate of three pounds of coal for every horse-power per hour, we cannot but blame the extravagance of those who, rather than exert themselves to introduce a few improvements, consume six pounds to obtain the same amount of force. There is no doubt that so far the influence of the boiler insurance companies in this direction has been exerted for good. It is to be hoped that evidence will not only be forthcoming, with regard to the terrible disaster which occurred at Walsall, to show that the Insurance Company, through their inspector, had not been guilty of neglect, but that the neglect of their instructions led to the catastrophe. If this is proved, instead of shaking the confidence of the public in the efficacy of such institutions it will help to confirm it. The interference of an inspecting department on behalf of the State is by no means to be desired if the same objects can be attained by other means. We have already referred to the satisfactory working of systems of inspection in connexion with the shipping interest, which have not only done well in practice, but which have obtained the sympathy and support of all concerned. Although there are not so many stimulants in the case of boilers, either in the amount of money involved or in the dangers to which they are subjected, it is still to be hoped that they will be sufficient to lead to a spread of the system of insurance with all its attendant advantages. At any rate, we trust that things will not become so bad that the Legislature will have to step in before the insurance companies have had time and opportunity for asserting their efficiency.

ARCHITECTURAL WRITERS OF THE RENAISSANCE.

IN the course of some lectures on the artists of the Renaissance, lately delivered at the Collège de France, M. Charles Blanc had occasion, in speaking of the great architect and universal genius, Leo Battista Alberti, to relate an anecdote which may not be uninteresting to English readers. The story was told in connexion with M. Blanc's criticism on the use which Alberti made, in common with all the artists of the Renaissance, of the orders superposed. Long convinced, but without having been able to assign a reason, that this custom was based on erroneous principles, M. Blanc, occupied in the preparation of his "Grammar of the Arts of Design" happened to be, many years ago, in England, with his brother, a guest of the late Lord Lytton, at Knebworth; where, one morning, talking over art-matters with the distinguished novelist's son, then far from having reached the position of Governor-General of India, this question of the superposition of the orders having been broached, M. Charles Blanc endeavoured to explain how he felt for his part that there was a reason why this custom of the Romans, and after them, of the Renaissance architects, was contrary to the laws of taste. Vainly searching for a positive reason in answer to the question of young Mr. Lytton, why this custom offended the laws of taste, M. Charles Blanc at length hit upon what he considered, and still considers, to be a valid argument against the superposition of the orders. This is based on the fact that each order possesses, so to speak it, moral or æsthetic meaning; the Doric order with its solid baseless columns, close by, set together, impresses the mind with a sense of stern reputation and inviolable strength. The Ionic order, on the contrary, with its graceful ornamentation, its elegant capital, and wide inter-columnar spaces, expresses precisely an opposite effect on the mind, that of inviting entrance.

Such, in M. Charles Blanc's opinion (though not in ours), is a satisfactory reason for our condemnation on æsthetic principles of the superposition of the orders, excusable in the architects of the Renaissance, as they had to study as examples only the relatively debased architecture of Rome, and as guide to its mysteries the then only recently-discovered manuscript of Vitruvius. So much for the anecdote, but the subject of the lecture in which it was introduced is, perhaps, more worthy of attention.

In the busy days of the Renaissance, architecture, like the sister arts, received a fresh impulse from the revival of Classic study. The discovery of the manuscript of Vitruvius, treasured up in the library which Nicholas V. had founded in the Vatican, afforded a fresh field of research for the architects of the day. During the sixteenth century, three treatises on architecture were the result of this enthusiasm; the most complete of these was that of Leo Battista Alberti; the second, which still remains in manuscript in the Magliabecchiano Library at Florence, a treatise by Filarete; the third, by the architect Francesco di Giorgio, one of the many artists who graced the court of Urbino. Of these treatises, Alberti's deserves the first attention. Alberti, who has with no small reason been termed the restorer of architecture in Italy, was peculiarly suited to the task he took in hand. His erudition was, even in an age of learning, more than common, and, strange as it may seem, the Latin tongue, in which he wrote his original work "De re Ædificatoria," was more familiar to him than his own. The folio volume, published in 1485, shortly after his death, by the care of his brother, is a work of learning and careful consideration, too little known to the profession, and the only work of its time which can in the present day be placed with that of Vitruvius.

Translated into Italian in 1550, three years later Jean Martin, secretary of Cardinal Lenoncourt, translated the work carefully into French. For English students there is the edition of London of 1726 (3 vols. folio, with figures), in Italian, accompanied with an English translation "by James Leoni." In this volume are collected Alberti's treatises on architecture, painting, and sculpture, for he was not only an architect: his genius was universal; the mere enumeration of his inventions and discoveries would amply suffice to form an instructive article. Had not Leonardo da Vinci existed, Alberti would have stood alone in the history, not alone of the arts, but of the world. Our present purpose is to glance at the treatise on architecture left by him, many points of which are worthy of attention, though four hundred years have elapsed since they were first penned.

Commencing with a customary preamble, Alberti shows the reader the importance of architecture, and, what we in the artistic language of the present day only recently introduced from the Continent term its æsthetic meaning; he then proceeds to discourse learnedly on the properties and quality of air, climate, and what we now generally term "hygiene." Further consideration is then given to the area or ground-plan of buildings; the forms suitable, the circle being that most easy, and the least expensive to inclose. Curves are, however, more commonly replaced by angles, such angles never being in unequal numbers. The house, remarks Alberti, is a little town, and then he enters into its construction, and the materials necessary; but one strange remark at this point cannot fail to strike the reader when the author remarks that in the building of large edifices large materials should be used. Alberti had visited Rome, and there studied the remains of the architecture of the Romans, but in making his statement regarding the use of large materials for large edifices he seems curiously enough to have overlooked the huge Temple of Peace, built of small bricks, and which is one among the few remains of the past which have stood the attacks of man and time. Alberti does not neglect to speak of windows, doors, and other openings, and gives various precepts as to their proportion, size, and position. Among these latter he advises that the windows should be placed high; the door, as he explains by figures, should not exceed in height twice its width, nor ever be lower than the length of the diagonal of the square of its sill.

In his second book (the work is divided into ten) Alberti gives a piece of advice which it would be well for architects more generally to carry out than they now do: he advises that the architect should not alone content himself with his plans on paper, but prepare models in wood, on paper, or any other material, "by means of which the proportions and appearance of the whole, and its details, may be judged; which model executed should be submitted to competent judges to have their opinion, with the drawings, in order that the contractor may not fall into errors, of which when too late he may have to repent." This custom, it will be remembered, was almost invariably carried out during the Renaissance;

Michelangelo has left us a huge model of a portion of the cornice of the Farnese Palace; of St. Peter's there are several models, by San Gallo, by Michelangelo, and by Fontana; and Sir Christopher Wren, we may add, often took the same precautionary step.

The following book treats of the various woods used in building; a chapter which is noticeable for explicit clearness and detail. The consideration of stone, its use, and properties is then entered into, Alberti quotes Cato's advice that stone should be taken from the quarry in summer, and exposed to the open air for at least two years before being used; the methods of moving stones are shown by figures and description; tiles and bricks, and how they are laid, do not escape Alberti's attention; the question of joists and beams he considers minutely, and shows several methods for their elongation.

The position of cities receives attention; and valuable advice is given as to their situation on rivers (the position of cities on rivers flowing from east to west, like Paris and London, is superior to those on rivers from south to north, or *vice versâ*), on mountains, in valleys and elsewhere; then he speaks of the various public buildings, as granaries, prisons, farms, kitchens, stables, docks, &c. Alberti was, indeed, a universal genius; what to others would seem serious occupation, to him was a pastime; but his study was so severe, that at thirty his mind momentarily broke down under the trial. He recovered, happily, and lived to an advanced old age. But not alone content with practical information, Alberti more than once will be found inserting valuable moral and philosophic lessons in his work, and these are not the least interesting portions of his remarkable book.

When he speaks of stables, he enters into minute details as to the necessity of consideration being given to the animals, whether horses, oxen, mules, or what not; he speaks of the position of the windows, the racks, and the need of drainage and air, &c.

His sixth book is devoted to a short history of architecture, passing its "adolescence in Asia, the flower of its age in Greece, and arriving at perfect maturity in Italy"; incidentally he refers to geometrical forms, shows how hexagons and decagons may be formed; gives measures of columns, capitals, entablements, architraves, &c.; one feature, the consideration of porticos, is treated at especial length.

The plan of temples, amphitheatres, city gates, the senate house, the public baths, and other public buildings occupies one whole book. In speaking of temples, Alberti remarks on the religious value of gloom and obscurity, the necessity for the windows being high so as alone to show the sky. The Greek temples, it is contended, though the question has given rise to no small amount of dispute, were alone lighted by their door. Alberti, it must be remembered, in common with all the great architects of the Renaissance, never visited Greece, a fact which must be constantly borne in mind. Roman architecture, itself a mere derivative of Greek architecture, formed the sole models studied by the great Italian architects. During the long years that succeeded the capture of Greece by the Turks, in 1452, till, in fact, the battle of Navarino, in 1827, Greece remained almost a land unknown but to a few rare unprofessional visitors. This fact, let it be repeated, must ever be borne in mind in considering the work of the Renaissance; Vitruvius also formed the sole guide to the comparatively few Roman remains that had been discovered or existed in the fifteenth and sixteenth centuries.

Alberti's eighth book treats specially of the decoration of cities. Among his propositions is one which, strange to say, M. Blanc had unwittingly introduced into the volume he is at present preparing on the "Decoration of Cities." This plan consists in having covered bridges. In summer as in winter such bridges would be, indeed, a boon against the heat and the cold. The Bridge of Hadrian in antique Rome we know was covered; why, it is asked, should we not now also have covered bridges, the pictorial effect of which could not fail to add to the decoration of our cities? The important question of the garden is not neglected by Alberti among his various counsel on the ornamentation of the house. His tenth and last book remains in its sagacious advice as valuable now as ever. In speaking of the faults which occur in buildings, whether arising from imperfect conception, execution, or what not, his counsels are excellent; including various shrewd pieces of advice regarding water and its virtues, the precautions to be taken in introducing it into the house by earthenware, not lead pipes; regarding numerous other domestic and hygienic subjects; and with some excellent advice to architects generally Alberti closes his remarkable volume, throughout which his modesty is almost as equally apparent to those who know how actively he was employed during a long life, as is his deep and sound erudition.

THE ANNUAL REPORT OF THE METROPOLITAN BOARD OF WORKS.

WHILE the immense public works carried on under the Government of the Second Empire in France, in Paris, Lyons, Marseilles, and other great centres of population, have no exact parallel in this country, the steady growth of the annual expenditure of the Metropolitan Board of Works gives a measure of the activity of the body which exercises, to some extent, the function of Ædile in London. The annual interest on the debt already incurred by this body reached, for last year, the formidable sum of 560,000*l.*, and the current expenditure was over 800,000*l.* The increase in the sum on which interest has to be paid also continues. In some cases the expenditure tends to effect both saving and facility for traffic, which, though it fails to appear in any formal balance-sheet, may be actually worth much more than its cost to the ratepayers. Such is the case with the sum of over 500,000*l.* paid within the last year for the purchase and freeing of the toll-bridges, one of the most sensible reforms of our time. It would not be amiss for the Metropolitan Board of Works to present the ratepayers, from time to time, with the statistics of the traffic over these bridges. If the number of vehicles, horses, and passengers, were annually taken on the same day of the year, the evidence thus to be collected of the growth of the traffic might prove, hereafter, of much value. As to Waterloo Bridge, judging from estimate alone, the growth of the traffic has been considerable. On the first freedom of this thoroughfare, the increase was not what was expected. We apprehend, however, that it has been steady and persistent. There are certain questions which have more than once excited considerable debate, and which may be expected, hereafter, again to arise, on the discussion of which the value of such statistics will be considerable. And we may add the case of the Thames Steam Ferry. We know that attempts have been made, —and made in vain,—to ascertain the details of the traffic carried on by that convenient mode of crossing the river. Yet nothing can have more value, in any discussion of the mode how best to connect East London north and south of the Thames, than returns of the passengers actually conveyed through the original tunnel, the small footway tunnel at the Tower, and over the Steam Ferry.

With regard to the expenditure of above 600,000*l.* for street improvements, and 280,000*l.* for the dwelling-house improvement fund, the question of pecuniary return is more open. All expenditure on a very large scale in London incurs a certain risk. In the recent improvements, which have so greatly changed the architectural aspect of the metropolis, we have been effecting, at an enormous cost, what Sir Christopher Wren, had his advice been followed, would have carried out when the ground was cleared by the Great Fire of London. In most of our recent rectifications of the courses and widths of the main streets we have been paying the penalty of the neglect of our ancestors 214 years ago. But it is hardly in accordance with experience to anticipate that such growth will be perpetual. As yet we believe that the value of certain central positions in London is on the increase, rather than otherwise. But, at the same time, we have to observe the remarkable phenomenon of large cleared spaces, in the City and other densely-peopled parts of the town, which remain unbuilt on from year to year. For the purposes of habitation the cost of land in London now touches, in some parts, on a prohibitive rate. And when high rents for shops or for offices cannot be commanded, a cleared area is, even now, something of a white elephant, as more than one body of owners has found.

The question of the growth of London is no new one to our readers. Nothing is more difficult than correctly to predict the effect of any great revolution. Thus it might have been anticipated that the introduction of the Underground Railway would have been attended by a diminution of the omnibus traffic, a result which has not occurred; and it is possible in the same way to miscalculate the outcome of any new element in our social intercourse. With that reserve, it may be questioned whether a limit to the constant increase to the metropolis at large, and to the consequently increasing value of its area in certain localities, may not result from the perfection of the electric telegraph and of the telephone. When men of business in any part of London can be informed by this machinery, as is now the case, of every quotation marked on the Stock Exchange, as it is booked, or of any movement in any other of the great centres of trade, one of the strongest motives for the morning journey to the City will, we can hardly doubt, be removed. When, in addition, it becomes easy to interview one's broker, banker, lawyer, to conduct purchases or sales, to ask or to give advice *viva voce*, through the telephone, it seems possible that many men will find that they can get through more business by staying at home and using the wires than by travelling to and from the City, where, again, they will find the wires in play. And if this is now the case in the suburbs, it will, we apprehend, gradually become the case at greater distances from London. It is not making too strong a draught on our confidence in mechanical progress to anticipate that the telephone may hereafter become, if not quite so wide-reaching in its range as the electric telegraph, yet manageable all over England; and it is not attempting to prophesy to say that, if this be the case, it may result that one of the great motives for the annual increase of London may be materially reduced.

Thus, while the present rate of a little more than 6d. in the pound in the consolidated rates may be anticipated, if continued for forty years, to produce an annual income of at least 1,200,000*l.*, we must not count with two much certitude on an unlimited growth of the area of taxation. We are not now offering any criticism on the expenditure of the Metropolitan Board of Works. In some cases, as in the purchase of the bridges, it has our full sympathy. In some, as in the expenditure of 2,000*l.* on electric lighting, the Board has taken, it seems to us, a spirited step in the right direction. In other instances, as in the outlay on the three Water Bills, it cannot be denied that the Board was ill-advised as to detail, while at the same time it has shown a certain appreciation of the tendency of public opinion. The same may perhaps be said as to the scheme for a bridge east of London Bridge. However these matters are ultimately settled, we cannot but doubt that they will be allowed to slumber for ever. And it is possible that by the close of the century we shall look back on projects which now appal us by their magnitude as but feeble and inefficient provisions for the urgency of the future wants of the metropolis. Meantime, all those who have to vote or to act in any public or social capacity, should keep their attention duly fixed on the annual proceedings of the Metropolitan Board of Works.

FROM THE BANKS OF THE SEINE.

IN artistic circles here, not a little interest was roused a few days since by the promise of what in French Parliamentary language is termed an "interpellation" "on the direction given," —we quote the words of M. Robert Mitchell, the well-known Bonapartist deputy,—"to the Fine Arts." The members of all the branches of the fine arts,—the architects, the sculptors, and the painters,—looked forward to their interests being closely regarded in the Chamber. But M. Mitchell's lengthy requisitory proved to be merely an attack on the Secretary of State for the Fine Arts,—already so sadly abused for his management of the department under his control. We pass over the honourable deputy's remarks regarding the theatre, contenting ourselves out of the report of the day's proceedings with merely referring to those portions of his "interpellation" relating to the *Salon*. Certainly M. Mitchell is right in attacking the culpable complacency of the jury in receiving no fewer than 8,000 pictures, and, *apropos* of his remarks, we may add a fact which we only learned a few days since, that there are many pictures *catalogued* which have not yet been, nor ever will be, hung at all. Putting aside M. Mitchell's political attack on the Secretary of State, while we cannot help agreeing with the honourable deputy when he disapproves the attempt to

introduce a democratic spirit into the management of the arts, the reply of M. Turquet, the Secretary of State, was thoroughly explanatory. It is of little interest to English readers to hear of these somewhat unseemly, and in every case utterly useless, discussions, but one remark in the Secretary of State's lengthy reply is worthy of notice. M. Turquet recalled how at the outset of his entry on office his attention had been drawn to the necessity of active measures to raise high art (*le grand art*), "menaced with decadence, and to develop in France its industrial art, in which the last Exhibition has shown our inferiority." Probably the most valuable result of the discussion as also the unsatisfactory nature of the Exhibition, which was its direct cause, lies in the fact that one more proof is afforded of the error of an active Government interference in the management of the arts, instead of a wisely-exercised patronage.

In the mean time, the success predicted for the Exhibition is more than surpassed. In the first eleven days no less than 89,000 francs were taken for entries and catalogues, last year only 60,000 francs being received in the same period. As we are speaking of the *Salon* we may mention, as interesting to those who may intend visiting Paris within the next week or so, that the Exhibition is to be closed according to custom for four days, from the 1st to the 4th of June, inclusively, to re-open on the 5th with an additional attraction of a horticultural show. During the interval the jury will decree their recompenses.

While in the French artistic world it will be seen that there are still many difficulties to settle, the recent strikes which have taken place in the North of France show that in the French industrial world the relations of employers and employed are far from being satisfactory. As these lines are being written the dispute promises to be settled, but only after much bad blood has been roused; the men have agreed almost entirely to submit, and accept only a small increase; indeed, the settlement of much of the suffering and inconvenience consequent on the strike hangs on a matter of pride on both sides. This new phase of French industrial existence has roused much attention among those interested; the difficulties from which we in England have had to suffer are beginning to beset France. Numerous plans are proposed, one being especially urged, the extension of the system of *arbitrage*, now applied to all commercial disputes, to the settlement of strikes. In the present period of social transformation so evident to every observer, the whole condition of our existence has undergone a change. Fortunes are gained —and lost, too,—with a rapidity unknown to past generations, and the relations of masters and men have almost entirely changed; the old bond of union has been broken, and we even see them constantly pitted one against the other. Some permanent organisation is necessary to prevent these shocks becoming more frequent, and it is felt that this organisation lies in the numerous trade committees which now exist. The *Nouvelle Revue* has taken up the question in an important article recently published, the first part of which (we refer those interested to the number for May 15) treats of the masters' trade committee. There exist in Paris two principal groups of masters' committees (besides several minor committees), and it may be mentioned that the oldest of these is that of the "Sainte Chapelle," composed of twelve sub-committees all connected with the building trade. This is all that remains of the guild system of antiquity. From various indications, it would seem, indeed, that long experience shows that there would be no danger in a return to the old system of corporations, abolished here by the French Revolution. Without entering into the suggestive statistics furnished by M. Berr in his article, we may mention one item which will show how active are the committees to which reference has been made. In one year, that of 1872-73, no fewer than 3,000 trade disputes were taken into consideration, out of which 2,000 were brought to an amicable conclusion. It is felt on all hands that a legal and official organisation of the trade committees is requisite, and the recent strikes have only served to prove the truth of this view. As was remarked not long since by a French contemporary, this acknowledgment of the value of the trade committees will be a great step taken towards the solution of several important social questions, if not of *the* social question.

While the recent alarm roused on the banks of the Thames by the prospect of the venerable river being positively blocked up by sewage mud has not subsided, and has only again raised the interminable question, so often satisfactorily answered, of the undoubted utility of sewage, here on the banks of the Seine the question of the river being used as an outlet for the Paris sewage is being hotly discussed. Certainly at present the whole sandy plain north of Paris is rendered uninhabitable from the management of the city outlets, and the fish die in the river directly below Paris. While the matter is being discussed, M. Lévy has ingeniously secured the salubrity of the neighbourhood of Bercy by means of an invention which it is expected will register a progress in the history of the sewage question. Bercy is on the south bank of the Seine, and hence it has been found extremely difficult to direct its sewage to the main-collector, situated on a higher level, and separated also by the Canal St. Martin. Without entering into the details of M. Lévy's apparatus, suffice it to say that, after repeated failures on the part of the authorities, this gentleman has succeeded in solving the difficulty by the use of an enlarged model of the simple domestic syphon; the sewage by this means now passes at a height of more than 30 ft. above the canal, out of the way of the masts of the barges, and reaches successfully and without attention the main collector.

To those who may be interested in the archæological and artistic treasures of France a volume very recently published on the Cathedral of Cambrai ("Histoire artisque de la Cathédrale de Cambrai," par Jules Houday. Lille: L. Danel) cannot fail to be agreeable. With the aid of various inventories and documents, M. Houday has successfully drawn a history, and restored the aspect, at different epochs, of the venerable metropolitan church, which appears to have been the most important and most richly-decorated of the religious edifices in the north of France; the diocese, indeed, extended as far as Antwerp. The author follows the cathedral from its origin in the eleventh century, through the transformations which in the middle of the eighteenth century so seriously altered its appearance, down to its official destruction in 1796. The perusal of the old accounts kept by the abbots (matter which to all but the true archæologist is essentially "dry") has furnished much interesting information, showing, above all, the extraordinary artistic activity of the Middle Ages. The chronological table alone of the artisans or artists,—in those days little difference was made between them, but that difference was well marked,—mentioned in the old accounts, furnish 482 names of glass-painters, carpenters, pewter and earthenware potters, plumbers, painters, seal-engravers, coiners, musicians, clock-makers, bell-founders, locksmiths, *imagiers* or image sculptors, illuminators, *papetiers* and book-binders, embroiderers, and architects. A view of the cathedral is given, photographed from an original drawing (preserved at the Gobelins tapestry works) by Van der Meulen, who accompanied Louis XIV. in his Flemish campaign. With the plan executed at the time of the demolition, and a plan of Cambrai in relief, made in 1695, and carried off at the commencement of this century, and now preserved at Berlin, we have all that remains of the monument, the history of which is so skilfully told by the author of the volume.

Sanitary Conference, Society of Arts.—The conference which has been held annually since 1876 by the Society of Arts on subjects connected with public health is announced for the 10th and 11th of June. As in former years, Mr. Stansfeld, M.P., will preside. The programme is arranged in three divisions, the first of which deals with sanitary administration and organisation. The first point taken up under this head refers to the constitution of county boards chargeable with the conservation of rivers, the appointment of county health superintendents, &c.; the second sub-division relates to the formation and regulation of sanitary districts; the third, to the method by which members should be elected on the county boards; and the fourth, to the method of inspection which, it is suggested, the Local Government Board might adopt. The second main division of the programme relates to the amendment of of the law—1st, the Public Health Act, 1875; and 2nd, the Pollution of Rivers Act, 1876. The third main head refers to a proposal for a sanitary inspection and classification of dwellings.

REVIEW OF THE HALF-YEARLY MEETINGS OF THE RAILWAY COMPANIES.

WITH the meetings of the shareholders in the Scottish railways, which are always held at a later period than those of the English and Irish companies, the half-yearly gatherings of the proprietors of these several corporations have been brought to a close within the last week or two. The great decrease of traffic on most of the lines during the half-year ending with December last, consequent upon the depression in trade, forms a prominent feature in several reports. On the other hand, the proceedings show that new and extensive works are in course of construction, or projected, by several of the leading companies, in anticipation of increasing traffic.

At the meeting of the *London and North-Western Company*, the chairman observed that he did not think there was a single proprietor who did not anticipate, or who would not willingly have compounded for, a reduced dividend; but he had to congratulate them on the fact that not only had there been no reduction, but they were able to pay a dividend which would make the whole dividend for the year equal to that of 1878. Adverting to the cost of maintaining the permanent way, he said that during the half-year there had been a saving of 38,000*l.* on this head, owing chiefly to the great reduction in the price of materials, the cost of steel rails having been 18s. 6d. per ton less than in the previous year. For eighteen years past they had been relaying the lines with steel rails, and they had now 1,100 miles of their lines laid with that material, which had cost them 2,250,000*l.* Referring to the serious accident in the autumn by the floods at the Llandulos Viaduct, and other bridges in the locality, he said it had cost them 40,000*l.*, and the absolute cost of reconstructing the viaduct had been 25,000*l.* He illustrated the recent great rise in the price of steel and iron by stating that steel rails were now selling at 9*l.* and 10*l.* per ton, against 5*l.* 10s. per ton which the company paid for them last year, and in laying down steel rails in the future the shareholders must be prepared to have to pay this increased cost.

The report of the *Midland Company* stated, amongst other things, that 66 miles of the line had been laid with steel rails during the half-year, the cost of which was charged to revenue. It further stated that the growth of traffic in and out of London had rendered essential the construction of a second tunnel between Haverstock-hill and Finchley-road, and the construction of an additional junction with the Tottenham and Hampstead line. Adverting to the still further extension works which were necessary by the continued expansion of the company's business, the chairman observed at the meeting that it was obvious that if the Midland Company was to carry the traffic which poured in upon them in good times, they would have, in goods stations, sidings, and a variety of other works, still to lay out a very large sum of money, and that fact he did not want for a moment to disguise from the shareholders. The company must carry the traffic which came on to the line, or obtain facilities for carrying it. The projected second tunnel at Belsize Park, one mile and three-quarters in length, was estimated to cost 432,767*l.*, and the cost of the Tottenham and Hampstead curve would be 71,132*l.* A line of two miles in length at Liverpool, to connect with the Bootle goods branch at the docks, where the great ocean steamers load and unload, was estimated to cost 178,898*l.* The entire capital required during the current half-year for new works in progress was 1,800,000*l.* During the past half-year, 800,000*l.* had been spent on capital account, a considerable portion of which was absorbed in laying down steel rails. They had now 87 per cent. of the main line laid with this material, and 29 per cent. of the branch lines.

The Severn Tunnel project formed a prominent feature in the report and proceedings at the meeting of the *Great Western Company*. The fact was stated that Sir John Hawkshaw had been appointed engineer to the tunnel, and that Mr. L. A. Watkin had entered into a contract to execute the whole of the works at the tunnel for the sum of 948,959*l.*, and that additional engines and pumps were now being prepared. It was noted that, although the influx of water would delay the completion of the tunnel, the engineer was satisfied that the influx would not affect the accomplishment of the work. The

report also stated that the Slough station was to be enlarged, and that it was proposed to raise a further capital of 200,000*l.* for other projected works, including 10,000*l.* for widening the line from Paddington to Slough; additional accommodation at the Bristol goods station, 15,000*l.*; new station at Newport, 20,000*l.*; new lines at Westbourne Park, 20,000*l.*; engine-shed at Birkenhead, 10,000*l.*; additional accommodation at Milford, Heytesbury, and other stations, 25,000*l.*; and additional rolling stock and machinery, 100,000*l.* In the course of his observations at the meeting, Sir Daniel Gooch, the chairman, adverting to the disaster at the Severn tunnel works, said they expected to have been entirely under the Severn in November, for there was only a very short distance to be finished, when they suddenly came upon what could not be called a spring, for it was an underground river; it was a large open culvert, full of water, sufficient to overmaster the pumps which they had at that time in the shafts, the consequence being that until they got down the shafts more powerful pumps, equal to pumping out the great volume of water, the works had to be practically suspended. The projected tunnel under the Mersey, between Birkenhead and Liverpool, was one of the principal subjects of discussion at the meeting. Mr. Christopher Bushell, of Liverpool, who is deeply interested in the undertaking, said that on account of the unfavourable position of the Great Western Company, as regarded Liverpool, only 200,000 tons a year of the vast traffic to Liverpool had fallen to the company. But if the proposed tunnel between Birkenhead and Liverpool were completed, the company would have a road traffic which would place them in the same position as the other companies having their termini in Liverpool. He therefore thought the directors should give their full support to the scheme. Mr. Bushell added that he was chairman of a committee of forty gentlemen closely interested in the commerce of the port of Liverpool, and it had been suggested that the scheme should be carried out by a public trust, consisting of the Birkenhead Corporation, the Liverpool Corporation, and the Mersey Docks and Harbour Board; and it was desired that the Great Western Company should be the fourth body, the total liability of each being 125,000*l.* In the course of a discussion on the subject the Chairman said that this tunnel scheme had certainly the approval of the directors.

It transpired at the meeting of the shareholders in the *South Eastern Company* that 2,000 artisans were at present employed on the harbour works at Boulogne, which were being executed by the French authorities under an arrangement with the South-Eastern Company. In connexion with the completion and opening of the harbour for a fixed service between London and Paris, *viâ* Folkestone and Boulogne, Messrs. Samuda Brothers and Messrs. Penn had been instructed to construct two new passenger steam-boats of large size, and a similar contract had likewise been entered into with Messrs. Thomson, of Glasgow. At the meeting the chairman stated that when the deep-water harbour at Boulogne was completed, communication between London and Paris would be made in seven hours.

The report of the *London and Brighton Company* stated that several of the new works which had been for some time in progress were nearly completed, including the Tunbridge Wells and Eastbourne line, the Ryde Pier and railway, the Chichester and Midhurst, and Lewes and East Grinstead lines, and the Newhaven Harbour and works. The chairman said that a large and steady increase of traffic along the company's lines, both in passengers and goods, showed that building, with a constantly-increasing population, was going forward throughout the district which the company served.

The *Great Eastern Company's* report stated that considerable progress had been made in carrying out the new important joint lines which were to be constructed by themselves and the Great Northern Company. The land-agents were engaged in the purchase of the necessary land, and the works on the first section of the line,—from Spalding to Sleaford,—were about to be let by contract. The new works at Harwich, for the improved accommodation of the steamboat traffic of the company, and for providing sufficient space to work the traffic on other parts of the line, were making considerable progress. The chairman stated that the inter-locking arrangement required by the Board of Trade had cost them, on an average, 2,000*l.* a station, and there were about 300 stations on the line. He added that, when the old Bishopsgate-street Station,—now being re-built as a goods-station,—was completed, 20,000*l.* a year in working expenses would be saved. The works at that station would yet cost from 150,000*l.* to 200,000*l.* before they were finished.

The report of the *London and South-Western Company* stated that extensive station improvements had been carried out during the half-year, and the platforms at seventeen stations, including those at Waterloo, had all been raised. In the course of the half-year thirty-six miles of the line had been relaid with steel rails.

At the meeting of the *London, Chatham, and Dover Company*, the chairman incidentally alluded to the enormous manufacture of bricks which had sprung up within the district of the railway during the last fifteen or twenty years, which, he said, had contributed a large sum to the revenue of the company. He observed, however, that as building in and about London during the past year, as compared with previous years, had been greatly depressed, it had reacted upon their brick-manufacturing districts in Kent, which had been followed by a loss to the railway company.

It appears from the report and proceedings at the meeting of the *Great Northern Company* that the sum of 310,731*l.* had been expended during the half-year on extensions, stations, and other works, and that, in addition to works now in progress on different parts of the system, 32,717*l.* were required for other works to be executed during the current half-year.

The report of the *North London Company* referred to the extensive building operations now going forward in the districts intersected by the company's line, from which a large amount of additional traffic was expected. The report likewise adverted to the opening, during the half-year, of two new stations, one at Mildmay Park and the other at South Acton.

At the meeting of the *London, Tilbury, and Southend Company*, the chairman stated that since the company themselves had undertaken the working of the line, a number of new engines, together with other plant, had been ordered. New workshops were also in course of erection at Plaistow. The chairman likewise alluded to the contemplated construction of pleasure-grounds at Southend, in which it was proposed that the company should take part.

The Inner Circle Completion scheme formed the main feature of discussion at the meeting of the shareholders of the *Metropolitan Company*. Sir Edward Watkin, the chairman, referring to the subject, said that, in conjunction with the District Company, the directors proposed to give the very enormous sum of 400,000*l.* for a right of way over some 600 or 700 yards of railway. They had offered to contribute one-third of the cost of the construction of the proposed new streets in the City if the public bodies would contribute the other two-thirds. The subject was still under consideration between the Corporation, the Board of Works, and the railway companies, but nothing had yet been decided.

The report presented at the meeting of the *Metropolitan District Company* stated that since the opening of the extension to Ealing, building on a large scale had been commenced in immediate contiguity to the several stations. It was now proposed to extend the line from Ealing to Uxbridge, and, adverting to this proposed extension, the chairman stated that the enormous cost of the parent line could only ultimately be made profitable by comparatively cheap lines being constructed in direct continuation of those already existing, along districts where there was an increasing residential population. He added that the proposed extension from Ealing to Uxbridge, eight miles in length, was estimated to cost 33,000*l.* per mile.

The statements made at the meeting of the *East London Company* were of a gloomy and discouraging character. The report stated that the Great Eastern Company would not permit more than seventy-nine trains per day each way to be run to and from the Liverpool-street Station, and that this was a mode of working which amounted practically to a confiscation of the property. The chairman, speaking on the subject, said that on the Metropolitan line they could run 500 or 600 trains each way in twenty-four hours, and as many trains could be run on the East London line, and, therefore, to confine the service to seventy-nine trains per day was simply strangling and garotting the traffic.

At the meeting of the *North-Eastern Company* the chairman adverted to the great variation in the cost of railway materials within the past twelve months. He observed that every article in use on railways was now advancing in price, and if any illustration were needed he might say that the quoted price of rails now, as compared with the prices quoted nine or ten months ago, had increased not far short of 100 per cent. Six months ago no one would have been bold enough to prophesy that by the month of March iron would have advanced in price as it had done.

The report of the *Lancashire and Yorkshire Company* stated that 413,240*l.* had been expended during the half-year on the purchase of land, the enlargement of stations, and on new lines and other works. The estimated expenditure during the current half-year for similar works was 303,607*l.* Several new branches in Yorkshire were in progress.

The expenditure on the docks and other works connected with the undertaking was referred to at the meeting of the shareholders of the *Furness Railway*, the Duke of Devonshire, the chairman, presiding. The report stated that 30,000*l.* more was intended to be expended on the docks. This outlay was necessary for cranes and other facilities at the docks, and also for widening and deepening the passage between the Devonshire and Buccleuch Docks, which was required for the accommodation of the larger vessels now frequenting the port. In the course of the meeting it transpired that about 1,000 tons per week of hematite iron ore were being shipped from Barrow, and although the large demand for this ore from America was active and likely to augment, the prospect of any great increase upon present shipments was not great, owing to the home demand almost monopolising the supply. The report stated that the price of iron ore had risen within five months from 10*s.* to 30*s.* per ton.

At the meeting of the *Caledonian Company* it was stated that the expenditure on capital account during the half-year had been 339,647*l.*, and that the estimated expenditure for the current year was 304,072*l.* The works at Gordon-street Station, Glasgow, and at the Grangemouth Dock and harbour, were still in progress.

The disaster at the Tay Bridge formed a principal topic at the meeting of the shareholders of the *North British Company*. The report stated that it was legally incumbent on the directors to make provision for the deplorable loss the company had sustained in connexion with the accident out of the revenue of the half-year, and as that loss was estimated at 120,000*l.*, there remained only sufficient funds to meet the payment of the preference dividends down to and including the Edinburgh and Glasgow Preference Stocks. The directors had prepared a bill applying to Parliament for the authorisation of the re-construction of the bridge at a low level, and for the raising of such further capital as might be required for the doubling of the bridge. The extension of the Queen-street Station, Glasgow, was proceeding.

SURVEYORSHIP ITEMS.

Worthing.—Mr. Walter Horne, Assistant-Surveyor to the Corporation of Southport, has been appointed Surveyor and Inspector of Nuisances for the district of Worthing.

Gravesend.—In reply to an advertisement for a borough surveyor for Gravesend, at a salary of 150*l.* per annum, there were no fewer than 91 applicants. These the General Purposes Committee have reduced to six, who will each have a personal interview with the committee.

The Sunday Society.—The fifth public annual meeting, in connexion with this society, will be held in the Great Hall of the Freemasons' Tavern, on this Saturday, May 29th. The president, the Earl of Dunraven, will deliver an address at four o'clock, and a good list of speakers is announced. There will doubtless be others in addition, for the Earl of Derby writes,—"I am not sure that I shall be able to attend the meeting of the Sunday Society on Saturday next; but if free from other engagements, I shall be glad to come; only do not announce me *before-hand*, as I cannot absolutely promise attendance. I have an entire sympathy with the objects of the society"; and Dr. Tyndall writes,—"I shall do my best to be with you I shall, if able, say a few words."

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ninth ordinary meeting of this Institute for the present session, held on Monday evening next, Mr. John Whichcord, president, in the chair,

The Secretary (Mr. William H. White) read a letter from the Société Centrale des Architectes, Paris, accompanying the presentation of the first four volumes of the second edition of a very valuable work, entitled "Manuel des Lois de Bâtiment." A fifth volume will complete the work, which has been edited by M. Chas. Lucas, assisted by a committee of revision presided over by M. Achille Lucas.

The Chairman moved that a special vote of thanks be accorded to the Société Centrale for this valuable contribution to the Institute library. The volumes might be said to contain the whole of the building regulations of Paris, where, as would be well known to many, great care and attention were devoted to such matters. The work could not fail to be of extreme value to English architects, and would probably be of use hereafter in the framing of Acts of Parliament bearing upon buildings in our own metropolis.

Mr. Charles Fowler, in seconding the motion, said that, as the chairman and others well knew, the building laws of our metropolis were not so perfect as they should like to see them, and it occurred to him to suggest that the Council of the Institute, as a properly qualified body of architects, should fully consider the subject as soon as possible, and make some suggestions for the improvement of our building laws.

The Chairman, in putting the motion, said he should like to add one or two words on the subject. If there was any branch of construction that appeared to be thoroughly unknown to the Metropolitan Building Acts, and to most of the Acts of Parliament governing buildings in provincial towns, it was that bearing upon the use of iron. The Building Acts were singularly deficient in their scope in respect to the use, not only of iron, but of such materials as terra-cotta. It was desirable, he thought, to extend the scope of the Acts so as allow of greater freedom in the use of those materials.

The following gentlemen were balloted for and declared to be duly elected, viz.:—As *Fellows*: Mr. C. J. Shoppee (Associate), Doughty-street; Mr. R. L. Hesketh (Associate), Aldermanbury; and Mr. Cole A. Adams (Associate), Holden-terrace, Grosvenor Gardens. As *Associates*: Mr. John Codd, Hill-road, St. John's Wood; Mr. George Lethbridge, Draper's Gardens; and Mr. J. M. Cory, of Shanghai. As *Honorary Associate*: Mr. G. J. J. Mair, F.S.A.

COMPETITIONS.

Mr. Thomas Porter said it would be recollected that at the special general meeting held on the 8th of March a committee of nine was appointed to consider the subject of reform in architectural competitions. It was felt, however, to be desirable that the committee should be very largely strengthened, and he therefore moved that the following twenty-two gentlemen be the committee, with power to add to their number, viz.:—Mr. Charles Barry (chairman), Professor Kerr (vice-chairman), and Messrs. T. Blashill, T. E. Collcutt, R. H. Carpenter, H. Dawson, C. F. Hayward, H. Jarvis, jun., S. Knight, J. D. Mathews, E. J. Payne, R. E. Pownall, E. R. Robson, H. N. Sheffield, W. M. Teulon, Cole A. Adams, S. Flint Clarkson, B. A. Paice, R. C. Page, E. W. Farebrother, H. Saxon Snell, and T. Porter (honorary secretary).

In answer to Mr. Joseph Clarke, Mr. Porter said that all the gentlemen named had consented to serve on the committee.

Mr. Street, R.A., was inclined to think that a committee of twelve rather than one of twenty-two members would be more likely to approach business with success.

The motion was, however, carried.

The Chairman said he had the pleasure to inform the meeting that the Council had that afternoon received, at the hands of Mr. Street, their past vice-president, a memoral of a most interesting character, consisting of two large volumes, containing the signatures of 1274 architects, with reference to the burning question of architectural competitions. That memorial would be considered by the Council of the Institute simultaneously with the consideration of the general question by the committee just appointed. It was hoped that the Council would be able to report on the question before the end of the session.*

Mr. Street said he thought the Committee just appointed should, to a great extent, follow the example of the promoters of the memorial which he had presented that day, and endeavour to get as large a number of architects as possible to give in their adherence to the reform of one or two points most needing reform. Personally, he should be the last man to propose to abolish competitions altogether, for that, he thought, would be a great mistake, especially in the interests of the younger members of the profession. The memorial simply pressed for reform in one point, viz., that in future competitions, no architect should compete unless there be a professional assessor or adjudicator. If that reform were conceded, many of the objections to competitions might be obviated. He hoped that the committee would confine their attention to the reform of one or two points, for if they attempted to make too many regulations they would subject themselves and the Institute to the kind of criticism which had fallen from Sir Edmund Beckett when the subject was last discussed.

Mr. Joseph Clarke intimated that there were several members of the Institute (himself included) whose names were not appended to the memorial, although they thoroughly approved of it.

THE USE OF IRON AND STEEL IN ARCHITECTURE.

Mr. William White, F.S.A., resumed the discussion† on Mr. J. A. Picton's paper on "Iron as a Material for Architectural Construction,"‡ and on Professor's Kennedy's paper on "'Mild Steel' and its Application to Building Purposes."§ The title of Professor Kennedy's paper was not particularly attractive, but the subject matter proved to be of very great interest, apart from the valuable information contributed by Dr. Siemens. No more remarkable proof of the value of steel as a structural material could be adduced than was found in the fact that its production had increased from 50,000 tons prior to the introduction of the Bessemer process, to 700,000 tons almost immediately after that event. The use of steel, with its increased lightness (as compared with iron), greater strength, and wonderful ductility and fitness for fine ornamental work under the hammer, was likely to lead to great results, but he could not concur in all the conclusions at which Mr. Picton had arrived. Iron had doubtless become, and would more and more become, an important factor in building, but to speak of "iron architecture" would be a solecism; for iron construction carried out *as* architecture must necessarily fail to be architecture, and if the extensive use of iron in construction should really lead architecture to take a new departure, he was afraid it would be a departure from the face of the earth. Scattering to the winds all previous architectural history and precedent, and beginning *de novo* with iron as the available material, a new order of things might, indeed, be arrived at, but the result would be Ferro-tecture, or anything but architecture. Such new mode of construction must needs always be harsh and rigid, from the nature of the material used, and could not dominate in the development of any new and really architectural style. Truly architectural forms, so readily and happily obtainable in other materials, were inconsistent with the nature of the constructive forces of iron. By the use of iron a far greater effect of airiness or elegance might be obtainable, but to give to iron a real or apparent massiveness was to destroy its character. An appearance of mass and bulk might be obtained by the use of hollow columns, cornices, and walls, but the result arrived at would be unnatural and false. Massiveness, on the other hand, was an essential element in all true architecture, so also was superposition. The use of ironwork permitted of the employment of the most elegant and fantastic forms in screens and gates, and the material largely admitted of application to the construction of roofs and floors of large span, railway stations, bridges, markets, exhibitions, &c. For such structures its utility and necessity must be undeniable, and it might well be allowed to supersede the use of other materials for such structures, always in strict subordination to present useful requirements,—to utilitarianism, in short. If architects called to mind the buildings, of almost any age, which had impressed them most, apart from engineering or scientific constructions, they would find them to be those which were most distant from anything like iron architecture, so called. For all monumental architecture, for all buildings intended to appeal to successive generations, architects would have to look to other materials than iron, for in so perishable a material no permanent embodiment of art was possible. Beauty in decay would never be immortalised by a poet who in a future age should take for his theme the wreck of an iron railway-shed. He quite agreed with Mr. Picton that the glories of the old smithy-work had passed away, but thought that the future of art was more hopeful. He had often wondered at the marvellous durability of mediæval ironwork. Modern wrought-iron work had suffered more in thirty years than mediæval ironwork had suffered in 300 years. Steel he believed much less susceptible to rust than was iron, and so there was hope for modern metal-work in the direction of the use of steel. Perhaps the Mediæval smiths possessed some process of preparing their iron, and the more efficient use of the hammer might have done something in that direction. For higher forms of art in cast or hammered work it was not to be supposed that iron or steel would ever take the place of bronze. Full of suggestion as was Mr. Picton's paper, and valuable as it was as a practical summary of what had been done and was doing in the world of metal, he (Mr. White) felt compelled to say that not only did he doubt, but he emphatically denied, the correctness of the proposition that if iron had been as available to the builders of the Parthenon and Le Mans as it was to us, they would have been as successful in its use as they had been in the use of marble and stone, regarding, of course, the purpose for which those buildings were designed.

Mr. Matheson said there was something to be urged on the other side. Perhaps even a hollow iron column was capable of being made a thing of beauty. As a material for construction, the condemnation which iron too often merited was partly owing to the manner in which it was applied, and we had not yet had experience of the best applications of the different kinds of iron and steel which were available. There was no doubt that steel was altogether in a transition state. In regard to steel joists, he believed that very few had yet been made, there being certain difficulties in the way. As to the use of iron or steel in the erection of fireproof buildings, he thought there was no difficulty in making a building fireproof if it were to be devoted to ordinary purposes; but if it were to be filled with highly-combustible matter, no sort of fireproof construction other than that applicable to the construction of a furnace would be adequate to resist the demand made upon it in case of fire. It was, no doubt, one of the great drawbacks to the use of wrought iron that it was not possible to get durability with it without painting it. The only process by which iron could be protected was hardly ever adopted in this country. He was afraid that girders which were inaccessible to the painter's brush would give a great deal of trouble to future generations, owing to rust. The difference in the durability of mediæval and modern wrought-iron work was due, he thought, to the corrosive influence of our modern London atmosphere. He thought that if any one compared the beautiful wrought-iron work about the New India and Foreign Offices with the cast-iron gates of the Royal Exchange, he would come to the conclusion that the latter, although possibly vulgar, judged by the standard of modern taste, were at any rate much better suited to resist the ravages of the London atmosphere.

Mr. Cowper, President of the Institution of Mechanical Engineers, entered at some length into the proper designing of columns and girders, his remarks being illustrated by diagrams on the walls. He pointed out, among other things, that cast-iron girders could not be economical unless the metal were put in the line of strain, and insisted on the necessity of gradually thickening the metal towards the bottom of a column where a thick bottom flange had to be provided. Where mouldings were required to form bases or capitals to columns, the metal in the column should not be cranked or convoluted to the form of the mouldings, but the column should be cast straight and the mouldings cast separately and applied.

Mr. Bernays, President of the Society of Engineers, said that Mr. Picton desired to develope the use of iron in architectural con-

* We print the memorial and the signatures on other pages.

† See p. 501, *ante*.

‡ See p. 496, *ante*.

§ See pp. 552, 582, *ante*.

structions. Now all materials,—it was an axiom both of the architect and the engineer, and had been mentioned by Mr. Picton,—all materials should be used in their natural state. But the architect, in perfect architecture, gave us the advantage of all his materials, such as they were, each presented in its own nature; but, when his building was put together and completed, he did not show the smaller details of construction, but kept his joints, ties, or fastenings out of sight, concentrating his attention on the production of a good outline. The engineer, on the contrary, made it an axiom that he must be readily able to get at and touch and see every tie, strut, bolt, and joint of a girder, and in carrying out that requirement the structure, when finished, had an air of unrest and nakedness which, to the engineer, was of no consequence, because he was in the habit of using metals in a dynamical form, whereas the architect used them in a statical form. Any construction necessitating the exposure of a number of small details after completion should, therefore, be designed by an engineer, and such structures as did not admit of small details being shown would come, he thought, very properly within the province of the architect.

Mr. Edwin Nash said he wished to ask a question relating to the durability of iron structures. It was in that room, many years ago, that he ventured to say that iron structures were the most evanescent structures on the face of the earth. He wished to ask the gentlemen who were so learned as to the properties of iron whether wrought-iron, when subject to more or less continuous vibration consequent upon concussion, had a tendency to lose its fibrous nature and to revert to its natural crystalline condition? If so, all iron structures subject to living loads were getting weaker day by day, through losing a portion of their strength.

Mr. Matheson said the subject had been thoroughly investigated, and the conclusion come to by the authorities was that it would require millions of strains and hundreds of years to destroy any such structures in the way indicated, provided, of course, that they were made with a sufficiently large and proper margin of safety over the calculated breaking-strain to resist all possible demands upon their strength without injury. The St. Pancras Station roof, if kept well painted, was likely to last hundreds of years.

Mr. Street said the subject, he must confess, was not one which had very great attractions for him. When he heard gentlemen in the course of the discussion talk complacently as to the best way of applying sham mouldings on cast-iron columns, and enlarge upon what might be done in the way of iron architecture, he felt rather alarmed for the future of a country supposed to be capable of enjoying iron buildings. The greatest danger and snare to architects in the present day consisted in the use of iron and steel girders in the middle of their walls. Almost every building erected now in every part of Europe was erected with the aid of these enemies of true construction, and it was delightful to hear that they were rotting rapidly. Such testimony tallied with his own experience very much. If a building was to be apparently constructed of brick or stone, its construction should be of brick or stone throughout. He was offended continually by seeing buildings which could not possibly in reality stand upon the terms upon which they appeared to stand. Take the case of the Albert Memorial in Hyde Park. Architects knew why that structure stood, because they had been told; it was supported to a great extent upon some girders which were possibly gradually decaying. In our business streets, the front wall of every house seemed to be resting on a sheet of plate glass. Such contrivances as iron girders and concealed columns enabled these things to be done, and led to a very false kind of architecture, besides leading to deterioration of skill in planning, one of the most charming branches of the art of the architect, owing to the fatal facility which iron girders afforded for carrying walls over voids as a rough-and-ready expedient for saving trouble in thinking out a plan. He agreed with almost everything Mr. White had said as to the incompatibility of the use of iron exclusively or at all largely in anything which could fairly be called architecture. He was also glad to see that Mr. White had demonstrated the falseness of the position in which Mr. Picton had placed himself by assuming that because iron was convenient for certain purposes, its use should be obligatory upon all architects. He (Mr. Street) wished engineers would study the art of design a little more in the present day; for in proportion as their work became more scientific, it became less beautiful. Corroboration of this assertion would be afforded by looking back at engineers' erections forty or fifty years old, many of which were far more artistic than similar things in the present day, though doubtless less scientific in principle. In the present day, ugliness seemed to be of the very essence of engineers' structures. As to the erection of iron houses, certain little erections in our streets, consisting of iron panels enclosed in a framework of iron, were far more consistent in design and execution than the iron façades of the New York shops (photographs of which were hung on the wall), in which all the ordinary architectural features were moulded in iron. But even if iron could be successfully and appropriately used for building the walls of houses, such houses would not be habitable. And because engineers and metallurgists had brought the manufacture of iron to great perfection, was that a reason why architects should use it, say, in the erection of churches, discarding the God-given materials of stone and marble?

Mr. Shoolbred, M.Inst.C.E., said he thought Mr. Picton's views had been somewhat misapprehended. In order to ensure the gradual introduction of steel as a building material, two things were necessary,—firstly, a considerable reduction in the price at which it could be manufactured; and secondly, the relaxation, to some extent, of the regulations of the Board of Trade. These regulations at present allowed a load of 6½ tons per square inch for steel, as against 5 tons per square inch for wrought iron. That was so small a margin that it did not cover the difference in cost. Eight tons per square inch was considered by many eminent authorities to be not too great a load to put upon steel. What he ventured to think was a satisfactory instance of the employment of iron in architecture was to be seen in the Church of St. Augustin, Paris. In conclusion, the speaker referred to the construction of the roof of the Picton Reading-room, named in honour of the reader of the paper, who had for many years devoted his best energies to the interests of intellectual recreation in Liverpool, and who was the pioneer and introducer of free libraries, which were now to be found all over the country. The Picton Reading-room was designed by Mr. Sherlock, and the iron roof was executed by Messrs. Bergheim & Co.

Professor Kennedy, in replying on the discussion, submitted to the meeting the following results of tests of steel and iron joists, the iron joists tested being the ordinary Belgian joists,—

Comparative Tenacity of Specimens cut from Iron and Steel rolled Joists 12 *in. by* 6 *in.*

	No.	Position in joist.	Breaking load in tons per □″	Extension in 3″	Fracture.
Iron joist.	330	Web along fibre	18·3	—	Half crystalline
,, ,,	331	Flange along fibre	19·6	0·05″	Entirely very largely crystalline
,, ,,	332	,, ,, ,,	18·84	0·05″	Very largely crystalline
,, ,,	333	Web across fibre	15·15	0·02″	About crystalline;—torn and laminated
,, ,,	334	,, ,, ,,	13·97	Not perceptible	,, ,, ,,
,, ,,	335	,, ,, ,,	8·19	,, ,,	Very bad weld
Steel joist.	337	Flange along fibre	47·73	0·43″	Granular
,, ,,	338	Web across ,,	48·13	0·68″	About ¾ granular, and the rest silky
,, ,,	339	Web along ,,	46·90	0·69″	About ½ granular and ½ silky

Mean tenacity of iron joist,—along fibre	18·91	Tons per square inch.
,, ,, ,, across ,,	12·43	,, ,,
,, ,, ,, ,, (omitting No. 335) ...	14·56	,, ,,
Mean tenacity of steel joist,—along and across fibre ...	47·59	,, ,,

These tests served to emphasise one point very strongly, viz., that if architects had to use large quantities of ironwork against their will, if they had it tested they should, at all events, take the precaution to have the tests made so as to tell them what sort of material they were proposing to use. He had most cordially enjoyed what Mr. Street had said, and agreed with him, but he would observe that it was not the unfortunate engineers who shut up iron girders in walls, or who tacked would-be decorative mouldings and other intended ornaments on to iron columns and other structural members. Engineers, as a rule, did their best to make their structures show the material and construction as clearly as possible, and as little unsightly as they could be. Of course, they could not compare an iron bridge with a stone one, nor were they desirous of mentioning them together. The tendency to use iron covered up by brickwork was not much indulged in by engineers, and it was to be hoped that Mr. Street would be able to persuade all architects to act as he did in that respect. In the Machinery Hall of the French Exhibition, which was, in some respects, one of the ugliest buildings he had ever seen, the effect of the interior of the roof was very much improved by the course therein adopted of making the purlins vertical instead of at right angles to the line of roof. Touching material itself, apart from its application, he had heard lately that a firm in Sheffield was now engaged in making a material which was, indeed, practically nothing but a very pure iron, as pure as mild steel, but very much softer. If such a material could be successfully produced, it would prove to be very useful for all kinds of hammered work, and would place at the command of architects and others a material which would be capable of giving as good results in working as that which the old workers in iron had at their disposal.

Mr. Street said he wished it to be understood that he was attacking architects, and not engineers, for the improper use of iron for constructive purposes.

Mr. Picton next replied. He observed that he seemed to have been rather misunderstood by one or two of the speakers, who had apparently inferred that he advocated the doctrine that iron should everywhere supersede the materials now in use, and take the place of timber, stone, and brick in the construction of ordinary dwellings and buildings. Such an idea had never entered his mind. Personally, he would very much rather go upon the old lines, and stick to the principles upon which true architecture in all ages had been designed. But architects could not and should not shut their eyes to the progress of things around them. The increased use of iron in all departments of human convenience was a fact which could not be gainsaid. Its use was increasing every day, and it would increase still more. There were, indeed, many purposes connected with construction in which the use of iron was indispensable. No doubt a gentleman so eminent as a Gothic architect as Mr. Street very naturally preferred that class of work in which he had attained so much distinction, and which was based upon the old principles of construction and the use of old descriptions of material; but if Mr. Street had to design a circular building 100 ft. in diameter, and had to put in a floor without any supports under it, what would he do? He could not do it with timber, nor with brick or stone vaulting; and if the job were to be done at all, conveniently and strongly, iron was the only material upon which the constructor could fall back. So with a roof such as that of the St. Pancras Station. Could it be done in timber? No. But in iron it could be done, for iron was a material which combined lightness, strength, and beauty, and he (the speaker) maintained that a structure in iron could be made quite as beautiful as one in timber. Such being the fact, and the use of iron increasing every year, he asked architects whether they were disposed to shirk the use of their talents and abilities in thoroughly mastering the best methods of applying iron in construction? Would they leave the development of the practical application of so valuable a material to the builder, the iron-founder, and the engineer? Or would they not rather apply to it those principles of truth in design which should make the material of additional use for constructive purposes? That, and that only, was the issue of which he had desired to treat in his paper. Of course, all true architecture must depend (as it always had depended) for its effect upon the nature of the materials used. In Switzerland and Norway we saw timber constructions, oftentimes very beautifully designed and carried out. In Belgium we saw an architecture of brick. Now, it was quite clear that the same principles of construction could not apply both to timber

and brick. Then, again, in Italy marble was a staple material, but it was one which required an entirely different treatment to that appropriate to brick or timber. In most parts of England freestone was largely used, both in modern times and by the mediæval builders. In Cornwall or Brittany granite was used, because it was the material of the district, but it necessitated a different treatment to that properly applicable to the comparatively easily-worked freestone. Iron having come so much into use in the present day, it was the business of the architect to appreciate it and make use of it with due regard to beauty and fitness. It was true that, as shown in the photographs from New York previously referred to, iron was a material which had been wofully misapplied, but what did that prove, after all? Firstly, that iron was forcing its way into use in spite of all that could be said against it, and secondly, either that architects had not been employed to design those buildings, or they had failed to design them in the most appropriate way, affording another proof of his contention that architects needed to study the true principles of designing ironwork. On the other hand, he could point to some examples of buildings lately erected in the provinces in which iron façades had been used with very good effect. In Manchester and Liverpool there were one or two examples of the kind, which were worthy of notice as successful attempts to design work in iron combining beauty with strength. Iron, wherever used in architecture, should be distinguished by the qualities which properly belonged to it, viz., lightness combined with strength and plasticity. Everybody knew what was the result to architecture forty or fifty years ago from the use of the abominable system of compo. It resulted in the most wretched construction and the most tasteless designs that could possibly be put together. Where iron was used, let it be honestly shown.

The Chairman, in closing the discussion, said he thought the observations just then made by Mr. Picton were extremely pertinent, and replied to a great deal that had been said in the course of the discussion. The subject was one of much interest, and Mr. Picton in his paper had gone back to the most remote periods, and had prefaced the more practical portion of his paper by a very interesting dissertation upon the antiquity and archæology of metals. Professor Kennedy's paper was a most interesting practical description of the manufacture and capabilities of iron and steel, and the remarks made by Dr. Siemens* at the conclusion of the reading of the papers really constituted another paper of themselves. The discussion had taken a very wide range indeed, and a variety of opinions had been expressed, containing a great deal that was suggestive as to the future use of iron and steel by architects. The photographs on the wall of Transatlantic iron buildings seemed to him to offend against all the canons of art in construction, and showed, above all, the utter unsuitability of iron as a material for the rendering of architectural features proper to stone construction. One other point worthy of notice was that, supposing iron or steel were to become very largely used in the construction of buildings, it would be necessary to approach the controlling authorities with a view to the modification of existing restrictions; for iron and steel were materials almost unrecognised in the various building regulations. Whatever opinion might be formed as to the merits or capabilities of iron æsthetically, it must be admitted that its use structurally might be made available from time to time to a much larger extent than was the case at present.

The next meeting of the Institute will be held on Monday, June 7th.

Society for the Fine Arts.—The Society for the Encouragement of the Fine Arts gave the third *conversazione* with music in this (their twenty-second) session on Thursday, 20th inst., at the galleries of the Society of British Artists, Suffolk-street, Pall-Mall. The guests were received by the chairman (Mr. James Edmeston), the deputy-chairman (Mr. John Saddler), and several members of the council, and later in the evening a concert was given, under the direction of Mr. Alfred Gilbert, of the Royal Academy of Music. During the evening about 450 ladies and gentlemen were present.

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* See p. 501, *ante*.

PUBLIC ARCHITECTURAL COMPETITIONS.

THE MEMORIAL TO THE PRESIDENT AND COUNCIL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

BOUND so as to form two handsome volumes, the signed copies of the memorial were presented at the Council meeting on Monday night by Mr. G. E. Street, R.A., and were produced at the ordinary meeting held thereafter. The wording of the memorial, divested of preliminaries, is as follows:—

"We, the undersigned Fellows and Associates of the Royal Institute of British Architects, being fully convinced of the unsatisfactory state of public architectural competitions as at present conducted, beg respectfully to bring the subject before the Council of the Institute for their consideration.

Your memorialists are of opinion that this question can most successfully be dealt with in the interests of the whole profession by the Institute, as representing so large a section of it, and they earnestly hope that the Council will be able to devise a remedy which, while ensuring greater advantages to the public, will at the same time place the competition system on a more satisfactory basis.

Your memorialists are further of opinion that the necessities of the case call for united action on the part of the profession, and that the most effectual way of ensuring this will be to devise some scheme whereby all members of the profession can agree not to take part in any public competition unless a professional adjudicator of established reputation is appointed; and to such a condition, if generally accepted, your memorialists are prepared to bind themselves."

The signatures of 153 Fellows and 159 Associates of the Institute have been received,—in any case a goodly number, and implying more support in the background, as Mr. Joseph Clarke took occasion to explain at the meeting. The signatures of 962 architects not members of the R.I.B.A. could not be appended to the exact words of the memorial given above. Provision to meet their case was therefore made by the following paragraph:—

"And we, the undersigned architects, not being members of the above society, are desirous to aid this reform in public competitions, as set forth in the memorial, and we are willing to bind ourselves under a similar condition, if generally accepted."

The total number of signatures up to the time of presentation amounts thus to 1,274;—from Ireland, Wales, Scotland, and all parts of England outside London, about 900; and the remainder from London itself.

The following analysis of the list (taken from papers signed by the memorialists, and from other sources, and which is as accurate as circumstances would permit) has been made by Mr. Cole A. Adams, who has acted with zeal and skill as honorary secretary throughout, and may be congratulated on eliciting an expression of opinion from the profession which unhopeful people might not have looked for. This analysis is not without interest, as a record, by accident, of the alliance of architects in active practice with the different societies throughout the country. The balance, left after deducting these numbers from the 1,274, are classed as "members of no societies,"—in some cases, perhaps, correctly, but most likely not in many. Still, the Institute has evidently a work before it,—to sweep all such active people within its influence as soon as may be;—beginning at once by enabling them to do for the good of the common profession some things which they could not manage on their own account as mere individuals. Among the memorialists there are:—

Architects practising in London	360	
Architects practising in the Provinces of England, and in Scotland, Ireland, and Wales	874	
Architects giving no address	40	
		1,274
Fellows of the R.I.B.A.	153	
Associates of the R.I.B.A.	159	
		312
Members of the R.I.A.I. (Ireland)		24
Members of the Architectural Association		148
Members of the Institution of Civil Engineers		41
Fellows of the Society of Antiquaries		21
Graduates of the Universities		12
Members of other Societies connected with Architecture and other Sciences, &c.		140
Members of no Societies		708

The President was evidently not far from the mark when he stated to the meeting that he considered the memorial "one of the most important communications ever made to the Council of the Institute." We have thought that the memorialists would wish to know each other's names, and that the world at large ought to see as much as possible of the signs of better things to come, and so we have given up space enough this week for about half the names arranged in alphabetical order, and will give the rest of the list in another number:—

Abbott, John O., A., London; Adams, Cole A., A. & A.A., London; Adams, Maurice B., A. & A.A., Chiswick; Adye, Charles S., Bradford-on-Avon; Aitchison, George, F., B.A., London; Aitkenhead, W., & Mason, Arbroath; Albury, Fred. W., F., Reading; Aldridge, Charles, F., Liverpool A.S., Liverpool; Allam, E. C., A.M.I.C.E., Wanstead; Allan, John, Stirling; Allen, J. Mountford, Crewkerne; Allen, Thos., A., London; Allsop, James, Worcester; Ambler, Thos., Leeds; Anderson, R., F., Edinburgh; Anderson, Tom, Leeds A.A., Leeds; André, J. Lewis, Horsham; Andrew, James, London; Andrews, Oliver, Stowmarket; Andrews, Robert T., Hertford; Appleby, Alfred, Sheffield; Archer, Alfred Wm., A., ; Archer, Thomas, F., London; Archer, T. Searancke, A. & A.A., London; Ardun, Arthur, Leicester S.A., London; Argile, R., jun., Derby; Armfield & Bottomley, Whitby; Armour, John, jun., Irvine; Armstrong, Francis, Dumfries; Armstrong, Richard, F., London; Arnold, Thomas, A., ; Artis, Addington, A., New Wimbledon; Ashbridge, Arthur, London; Ashworth, Edward, Exeter; Aspinall, Miles, Blackburn; Athron, Joseph, Leeds; Audsley, G. A., F., Liverpool A. & A.S., Liverpool; Audsley, W. J., F., Liverpool; Austen, H. G., F., Canterbury; Austen, Hubert T., Lancaster; Aydon, Isaac, Mold.

Bacon, Henry F., A., Bury St. Edmunds; Badcock, J. Barlow, F. & A.A., London; Bailey, F. E. F., A., Walsall; Baily, Charles, Newark-on-Trent; Baird, Will. & Arthur, Airdrie; Baker, Chas., F., & Leicester and Leicestershire S.A., Leicester; Baker, Orlando, Swindon; Baker, W. Lewis, A.I.C.E., London; Baldie, Robert, I.A., Glasgow; Banks, J. Lewis, A., Whitehaven; Banks, Wm. C., London; Barber, W. S., F., Halifax; Bare, Henry B., Liverpool A.S., Liverpool; Bargman, Fred., Dorking; Barker, A. Roid., A., London; Barker, E. H. L., Hereford; Barker, J., Theodore, London; Barker, Thos. G., Manchester; Barnes, Frederick, F., Ipswich; Barnes, G. Atkinson, A.A., Newbury; Barrington, William, M.I.C.E., Limerick; Barry, Charles, F. & F.S.A., London; Barton, Arthur T., A. & A.A., London; Barwick, William S., Ramsgate; Bath, Fred., Salisbury; Batley, Joe Thomas, Huddersfield; Batt, William, M.R.I.A.I., Belfast; Batterbury, Thomas, A.A., London; Baxandall, J. W., Leeds A.A., Leeds; Baxter, H. C., London; Bean, Alfred Cubitt, London; Beardmore, J. & Joseph, Stoke-upon-Trent; Beater, Geo. P., M.R.I.A.I., Dublin; Beazley, Charles N., London; Beck, C. Smedley, Norwich; Beckett, Thos. G. Southport; Beeston, Frederick, F. & M.I.S, ; Bell, Asahel P., Manch. S.A., Manchester; Bell, Charles, F., London; Bell, E. Ingress, A., Epsom; Bell, James, F.R.I.A.I., Kilkenny A.S., M.I.C.E., Dublin; Bell, William, Darlington; Bell, Wm., Thirsk; Belce, Charles H., M.I.C.E., Liverpool; Bennett, R. Christie, Weymouth; Benson, Chas., Yeovil; Benstead, J. R., Sleaford; Bensted, Hubert, Maidstone; Bentley, Alfred, Leeds; Bentley, John F., London; Bertwhistle, James, Blackburn; Best, Robert W., Exeter; Best, William R., Exeter; Bevis, Charles, W., Southsea; Bibby, George H., A., Manchester; Biggar, John, Edinburgh; Bilton, J. Coverdale, London; Binks, Chas. F., Manchester, Bintley, Joseph, Kendal; Birch, John, London; Birchell, Edw., F., Leeds; Bird, John, Huntingdon; Bisiker, Wm., A.A. & F.S.A., London; Bisset, J. Christopher, C.E., Dundee; Black, A.G.W., Falkirk; Blackadder, R., Dundee; Blackburn, E. L., F.S.A., London; Blacker, John R., Todmorden; Blake, E. C. H., London; Bland & Collins, Birmingham; Bland, James J. B., Liverpool; Blatchley, E. R., London; Blease, Charles W., F. Liverpool A.S., Liverpool; Blessley, W. Douglas, Cardiff; Blessley, W. H., Middlesbrough; Blomfield, Arthur W., F., M.A. & A.A., London; Bolton, Alf. Jno., London; Bonner, Horace T., Lewisham; Booker, Fred. R., Nottingham A.A., Nottingham; Booker, Robert, Nottingham A.A., Nottingham; Booker, William H., Nottingham A.A., Nottingham; Booth, A. C. Bulmer, A.A., London; Booth, Lawrence, F., Manchester; Booth, Walter V., Bolton-le-Moors; Boston, Robt., jun., Newcastle; Botham, Jno. R., F., Birmingham; Bovill, Alfred, A. & A., London; Bower, Thos., jun., Nantwich; Bowyer, William J., A., Cambridge; Boyd, John, M.R.I.A.I., Belfast; Boyle, Robt., Southport; Boys, John C., A.M.I.C.E., London; Brace, Henry G., A., ; Brade, Daniel, Kendal; Bradley, H., Huddersfield; Bradley, John P., F., Liverpool A.S., Liverpool; Bramall, Wm. Ed., Ormskirk; Brandon, David, F., F.S.A. & F.G.S., London; Brandreth, Fredk. T., Wigan; Brangwyn, W. C., London; Brattan, Jos., Birkenhead; Brede, A. R., A.A., London; Brereton, F.S., London; Bressey, John T., F. & A.A., London; Bridgford, J. H., M.R.I.A.I., Dublin; Bridgman, Geo. L., Torquay; Brookes, Samuel, Croydon; Brooks, James, F., London; Brooks, Samuel, A., London; Brown, Ed., Spitalfields; Brown, Thomas A., Stockport; Brown, W. Talbot, A.A., Wellingborough; Browne, Wm., York; Browne, Augustus Ed., London; Browne, Colvill, A. & A.A., London; Browne, H. E., Leeds; Browne, James F. T., Limerick; Browne, Thomas, A., Bath; Bruce, J. & J., Dundee; Bruce, John L., Glasgow I.A., Glasgow; Bruton, Edward G., F., Oxford; Bryce, John, Past Pres. Edinburgh A.A., Edinburgh; Bryden, Robert A., F., Glasgow; Bryden, William R., Bideford; Buck, J. M., Southport; Buckley, Harry B., A.A., Batley; Budd & Spire, Somerset; Bulmer, Geo. Bertram, Leeds A.A., Leeds; Burgess, Edward, London; Burnet, John, F. & I.A., Glasgow; Burton, Edgar H., Bournemouth; Butler, Francis, London; Butler, John, London.

Caley, M. Lawrence, Tunbridge Wells; Calvert Edward, Edinburgh; Calvert, Rhodes, Bradford; Came, R. Adolphus, A., London; Campion, Chas. W., Neath; Carey, John Geo., ; Carpenter, R. Herbert, F. & A.A., London; Carrington, H., Gloucester; Carroll, Geo., Liverpool; Carroll, J. Rawson, Dublin; Carroll, Wm., jun., Ennis; Carter, J. Bindon, Nottingham; Caws, Frank, Sunderland; Cecil, E. Durant, Croydon; Chalmers, T. W., Stafford; Champion, Wm. Scott, London; Champneys, Basil, B.A., London; Chancellor, Fred., F., London; Chapman, Joseph, Grimsby; Chapple, John, St. Alban's; Cheiake, Wm., Hereford; Chorley, Chas. Robt., Leeds A.A., Leeds; Christopher, John T., F., London; Church, W. D., London; Clampe, Robert, A., Hull; Clark, Geo., ; Clark, James, West Croydon; Clark, W. H., F., Bristol; Clarke, H. Francis, Briton Ferry; Clarke, John, A. & C.E., Liverpool;

Clarke, J. Somers, F., London; Clarke, Robert C., Nottingham; Clarke, Somers, jun., London; Clarke, Thomas C., Liverpool; Clarke, Thos. Chatfeild, F. & Coun. I.S., London; Clarke, W. W. Kendall, A., London; Clarkson, John, A. & A.A., London; Clarkson, S. Flint, A. & President of the Architectural Association, London; Cliff, W. H., Leeds; Clifton, A. G., A., Plymouth; Clipson, Charles A., Liskeard; Cobb, William H., A.A., London; Cobham, Geo. R., San. Inst. Great Britain, Gravesend; Cochrane, Robt., C.E. & M.R.I.A.I., Athlone; Cocking, J. William, Huddersfield; Codd, Frederick, Oxford; Cole, William, Parkgate; Colibran, William Henry, London; Collcutt, Thos. E., F. & A.A., London; Collett, John R., A.A., Ramsgate; Colling, James K., F., London; Collins, Frederic Hale, A. & A.A., London; Collins, H. H., F. & Inst. Surv., London; Colman, Stuart, Bristol; Colpoys, Arthur A. G., A., Hastings; Colson, John, F., Winchester; Colson, John B., Winchester; Conder, Alfred, A. & A.A., London; Cook, A. Stanton, A.A., London; Cook, E. Austin, A.A., London; Cook, Edward, Hastings; Cook, John Oliver, Woolwich; Cook, Thos., Liverpool; Cooper, Arthur L., Maidenhead; Cooper, C. & Davy, Maidenhead; Cooper, Son, & Millar, Reading; Corbett, William E., C.E., A.M.R.I.A.I., Limerick; Corby, Joseph B., Stamford; Corder, John S., A.A., London; Corson, George, Leeds; Corson, W. R., Past Pres. Manch. S.A., Manchester; Cory, John A., Carlisle; Cotton, John, ; Couchman, J. W., Tottenham; Cox, Geo. Jas., Cheltenham; Cox, Robert E., London; Cox, R. L., A. & A.A., London; Craig, J. J., C.E., Glasgow; Creed, Richard, London; Crickmay, G., jun., Weymouth; Crickmay, George R., Weymouth; Crisford, Amos, Eastbourne; Crocker, James, A.A., Exeter; Crofts, James N., Liverpool A.S., Liverpool; Crombie, A. B. & T., Dumfries; Cronk, E. Evans, A.A., London; Cronk, H. H. & E., Tunbridge Wells; Crowcroft, Samuel, Manchester; Crowther, J. S., Manch. S.A., Manchester; Crozier, William, M.I.C.E., Durham; Cubitt, James, London; Cull, Moses, Pontypridd; Currey, Henry, F., London; Currey, Percival, A., London; Curwen, Robt., A., Liverpool; Curzon, Henry, A. & A.A., London; Cutler, Thomas W., F. & A.A., London; Cutts, J. Edward K., A. & A.A., London.

Dage, Thomas A., South Shields; Dale, Daniel R., A., London; Dalgleish, C. R., Stafford; Darbishire, H. A., London; Darker, Horace, Colchester; Dashwood, Thos., J.P., Ryde; Davidson, John, Hawick; Davie, W. Galsworthy, A. & A.A., London; Davies, Chas. J. & Son, Newcastle Emlyn; Davies, Howel, Wrexham; Davies, T. M., Knutsford; Davis, John, Llangollen; Davis, J. Stacey, A., London; Davis John Statham, Birmingham; Davisson, John T., Scarborough; Davison, R., Son, & Mackenzie, London; Day, John, Bedford; Deacon, Chas. E., Liverpool A.A., ; Deakin, A. B., A.A., Shrewsbury; Deane, Edward Eldon, A.A., London; Dear, John Cox, A.A., London; Denman, Samuel, Brighton; Devey, George, London; Dibble, Fredk. John, Dorking; Dinwiddy, Thos., Greenwich; Dixon, Wm. Allen, London; Dodd, J. S., Reading; Dodgson, Daniel, Leeds A.A., Leeds; Dolby, Edwin, Abingdon; Dollar, Peter, London; Donaldson, Professor, F., London; Donell, George M., Upton; Donkin, J., Art Master, National Schools, South Kensington, London; Donnelly, T. Richmond, Coventry; Douglas, Campbell, F. & Pres. Glasgow I.A., Glasgow; Douglas, John, A.A., Chester; Doyle, J. Francis, Liverpool A.S., Liverpool; Doyley, James, F. & Liverpool A.S., Liverpool; Drake, John, Rochester; Dransfield, R., Oldham; Dresser, Alexander, Ph.D., F.L.S., London; Drew, Thomas, A.A., R.H.A., & M.R.I.A.I., Dublin; Drinkwater, H. G. W., A.A., Oxford; Drury, David, Leeds; Drury, Edw. Dru., F. & A.A., London; Drury, Michael, Lincoln; Duguid, Wm. & Sons, Ballater; Duke, Robert Rippon, Buxton; Dunderdale, H., Huddersfield; *Dunn & Hansom, *Northern A.A., Newcastle; Dunnage, George A., A., ; Dunning, Jos., Peckham; Durrans, Thos., London; Dyson, Richard, Harrogate.

Eade, William, A.A., Ipswich; Eagles, Thomas, H., A., M.A., & A.A., Cooper's-hill; Eales, Fred. E., A. & A.A., London; Earle, J. P., Sheffield; Earnshaw, J., Bridlington Quay; Eaton, John & Sons, Ashton-under-Lyne; Ebbetts, Walter J., A. & A.A., London; Edis, Robert W., F., F.S.A., & A.A., London; Edmeston, James, F., London; Edmeston, James S., A., Grad., & A.A., London; Edmonds, Alex. H., London; Edward & Robertson, Dundee; Edwards, Edwd. Henry, A.A., Bristol; Edwards, Owen, Rhyl; Edwards, Robert C., F., London; Egan, Edmond, A., Loughton; Elborne, H. G., Cambridge; Ellerton, M. K., A.A., Northwich; Ellis, Edw., London; Ellis, George, Manchester; Ellis, Jonathan, jun., Walsall; Ellis & Wilson, Aberdeen; Ellison, William, London; Elworthy, Thomas, Hastings A.A., Hastings; Elsarn, B.T., Hampton Wick; Emden, T. Walter, London; Emerson, Wm., London; Evans, Howard, Barrow-in-Furness; Evans, Robt., late Pres. of Nottingham A.A., Nottingham; Eves, George, Uxbridge.

Fairclough James, Tamworth; Farrell, Thomas, Sherborne; Farrar, James, M.I.C.E., Bury; Fawcett, Jos., Sheffield; Fawcett, W. M., F., F.S.A., & M.A., Cambridge; Fawes, Edward J., A., London; Fell, George, Manchester; Fennell, Wm. John, M.R.I.A.I., Belfast; Ferguson, J. M., A., London; Ferrey, Benjamin, F. & F.S.A., London; Ferrey, Edmund B., F. & A.A., London; Field & Burnet, London; Fillman, John, Sunderland; Fisher, W. H. C., Stroud; Fleeming, Thos. Henry, Wolverhampton; Flemming, Robt., Wigan; Fletcher, Walter J., Wimborne; Fletcher, W. H., London; Flint, William G., London; Fogerty, Joseph, F., London; Ford, Herbert, F., London; Forge, J. W., A, London; Forster, E. M., A. & M.A., ; Fowler, Chas., A.M.I.C.E., Leeds; Fowler, C. Hodgson, F. & F.S.A., Durham; Fowler, Geo. H., Homerton; Fowler, Jas., F. & A.A., Louth; France, Geo. Henry, Wakefield; Francis, Fredk. J., F., London; Freeman, D. F., M.R.I.A.I., Dublin; Freeman, Hubert A., A. & F.S.A., London; Freeman, Wm., Hull; Fripp, Samuel Chas., Bristol; Fry, Edward W., A.A., Dover; Fry, H. & A. P., Liverpool A.A., Liverpool; Fryer, Edward, Derby; Fulford, R. Medley, A., Exeter; Fuller, George, Lewes; Fuller, J. F., F.S.A., Dublin.

Galbraith, Arthur, A.A., London; Galbraith, Aug. W., Winchester; Galsworthy, James, Aldershot; Gandy, James, St. Helen's; Gant, William J., Hastings; Garlick, Park, & Sykes, Preston; Garratt, Thos., A., London; Garride & Johnson, Southport; Garry, James, Northern A.S., West Hartlepool; Gaskell, W., Cardiff; Gaunt, A., Leeds; Geoghegan, Charles, F., Dublin; George, Ernest, A., London; Gething, J. M., A.A., Kidderminster; Gibbings, William, Leyton; Gibbins, John Geo., A.A., Brighton; Gibbs, Edward, Stratford-upon-Avon; Gibson, John, & Son, A.A., Malton; Gibson, Thomas, Edinburgh; Gilbert, W. H. S., London; Gill, Wallace, A. & A.A., Bath; Gillespie, James, St. Andrews; Gimson, Robert, Dumfries; Glenn, John London; Glover, Geo., Lowestoft; Goddard & Son, Lincoln; Goldsmith, G. H., Manchester; Goodacre, Jno., Leicester A.A., Leicester; Goodacre, R. J., Leicester A.A., Leicester; Goodchild, Thos., F., London; Goodison, Atkinson, & Ford, Liverpool; Goodman, Thomas, Southend; Goodman, T. W., London; Goodridge, Alfred S., A., Bath; Gordon, John, Glasgow I.A., Glasgow; Gosling, William F., London; Gotto, Frederick, Leighton Buzzard; Gough, William Venn, Grad. R.I.B.A., Bristol; Gould, W. H., Ilfracombe; Gradwell, Arthur R., Prof. Ass. Liverpool A.S., Blackburn; Grant, David, Preston; Grant, Patrick, Greenock; Grant, Spencer W., A. & A.A., London; Grant, W. Leonard, Sittingbourne; Graves, Walter, London; Greatorex, R. C., London; Greaves, J. E. E., Rochdale; Green, Arthur, F., London; Green, Herbert John, Norwich; Green, Theodore K., A., London; Greener, Martin, Sunderland; Greenhill, William, Surbiton; Gregory, Vincent, Liverpool A.S., Liverpool; Grellier, William, A., London; Gribble, Chas. R., London; Grieve, Chas., A., London; Griffin, William D., Wolverhampton; Griffith, James, Ulverston; Griffith, W. Pettit, F. & F.S.A., London; Groom, Richard, A. & A.A., London; Groves, Thomas, Shrewsbury; Guillaume, G. H., London.

Hacking, N. Hartley, Manchester; Hadfield, Charles, F., Sheffield; Hadfield, W. G., F., Sheffield; Haddon, George Cowley, Hereford; Haddon, Henry, Malvern; Haines, R. T., Oxford; Hakewill, J. H., F., London; Hale, Wm., Pres. Birmingham A.A., Birmingham; Halket, Thos., jun., I.A. and Glasgow I.A., Glasgow; Hall, Henry, A., London; Hall & Henry, St. Andrews; Hall, J. A., Liverpool A.A., Liverpool; Hall, James, Skipton; Hall, John Green, M.I.C.E. & A.A., Canterbury; Hall, John G., M.I.C.E., Canterbury; Hall, Joseph, A.I.C.E., Leeds; Hall, Joseph, A.A., Leeds; Hall, Wm. John, St. Helen's; Hallam, John W., Oxford; Hamilton, Edwin J., Brighton; Hamilton, James, Glasgow A.A., Glasgow; Hammond, Geo., Mossley; Hancock, W. St. John M., London; Hansom, Chas. F., F., Clifton; Hansom, Edw. J., A., Newcastle; Hansom, Henry J., Clapham; Harding, John, & Son, Salisbury; Hardy, Henry, Edinburgh; Harger, Frank, London; Harper, Ewen, Birmingham; Harris, E. Swinfen, jun., A.A., London; Harris, Joseph, London; Harrison, Blake, & Sandiford, ; Harrison, Stockdale, Leicester and Leicestershire A.S., Leicester; Harrison, S. C., Hemel Hempstead; Harrison, William, A.A., London; Hart, James, A.M.I.C.E., St. Helen's; Harvey, Fred., Clapham; Harvey, Jas., Plymouth; Haselden, Thos., Bolton; Haswell, F. R. N., F., North Shields; Hawe, William, Beverley; *Hay & Henderson, Edinburgh A.A., Edinburgh; Haycock, Edward, F., Shrewsbury; Hayman, Henry, A., Barnstaple; Hayward, Chas. F., F. & A.A., London; Hayward, H. W., London; Hayward, John, A.A., Exeter; Hayward, Pearson B., F. & A.A., Exeter; Hayward, R. W. Govier, Newark-on-Trent; Heald, Thomas, Rainhill; Heaps, Arthur, Leeds; Heaseil, W. Arthur, Nottingham; Hebb, John, A., London; Heiton, Andrew, F.S.A., Perth; Hellyers, Thos., Ryde; Hemsoll, W. T., Sheffield; Henderson, Geo. C., Hon. Sec. R.I.A.I., Dublin; Henman, Chas., jun., A. & A.A., London; Henman, William, A.A. & Birmingham A.A., Birmingham; Hennessey, M. A., M.R.I.A.I. & M.I.C.E.I., ; Hepworth, George, & Son, Brighouse; Hesketh, R. Lempriere, A., London; Hesketh, William, Liverpool; Hewitt, Joseph, A., London; Hey, William, Hounslow; Hignett, Harold, Chester; Hildebrandt, A., A.I.C.E. & M.I.M.E., Manchester; Hill, Arthur, A. & M.R.I.A., Cork; Hill, Henry, Cork; Hill, Samuel, A. & A.A., London; Hill, Walter, Peterborough; Hind, Thomas, Leicester; Hindle, W. J., Barnsley; Hinds, Henry, Ramsgate; Hine, George F., F., & Hon. Sec. Nottingham A.S., Nottingham; Hine, Thomas C., Nottingham A.S., Nottingham; Hinton, G. H., Stratford-on-Avon; Hippisley & Sons, Wells; Hirst, J.H., F., Bristol; Hiscoe, Arthur, Harrogate; Hobson, Peter, Leeds A.A., Knaresborough; Hodge, J. L., A.M.I.C.E., Plymouth; Hodge, Thomas N., Southport; Hodgkinson, E. L. P., London; Hodgson, William, Darlington; Hodson, Price, & Hodson, per Geo. H., A.M.I.C.E., Inst. Surv., Loughborough; Hoggarth Bros., Kendal; Holden, E. Erasmus, Southport; Holden, Isaac, F., Past-President Manchester S.A., Manchester; Holden, James P., Manchester S.A., Manchester; Holden, Jno., F., M. Inst. Surv. & Hon. Sec. Manchester S.A., Manchester; Holding, Matthew, A.A., Northampton; Holford, F. H., Liverpool; Holland, Thos. Jno., London; Holme, Francis N., V.P. Liverpool A.S., Liverpool; Holt, Henry P., Leeds A.A., London; Honeyman, John, F., Glasgow; Hoole, Arnold H., A.A., London; Hoole, E., F., London; Hooper, T. R., Redhill; Hopkinson, Alfred, A.M.I.C.E., Bury; Hopton, Richard, Forest-hill; Hornblower, F. W., Hon. Sec. Liverpool A.S., Liverpool; Horner, H. P., Bournemouth; Horrox, Wm., Leeds; Houlst, Fred. Jno., Liverpool A.S., Liverpool; Houghton, C. Mew, Southsea; Houghton & Prescott, Liverpool; Houghton, W. Myles, Liverpool; Howard, Theodore A., London; Howdill, Thomas, Leeds A.A., Leeds; Howes, William, Leicester A.S., Leicester; Hubert, Alfred, Ipswich; Hudson, Edwd. Wm., West Brighton; Huggins, Samuel, Liverpool A.S., Chester; Hughes, Edward, F., Huddersfield; Hughes, Fred. G., hon. sec. Birmingham A.A., Birmingham; Hukins, J. Christian, London; Hull, Wm., Northampton; Humphreys, Frank H., A., Luton; Hunt, Fred. W., A. & A.A., London; Hunter, Robert, Dundee; Hutchins, W. Justin, Cardiff; Hutchinson, Thos. J., Crewe; Hutchinson, John, Glasgow; Huxley, W. Freeman, A.A., London; Hyde, Fredk., W., Brighton; Hymes, Samuel F., M.R.I.A.I., Cork.

I'Anson, E. B., M.A. & A.A., London; Ingall & Hughes, Birmingham; Ingelow, Benjamin, London; Irving, Andrew, Rochdale; Isaacs & Florence, A. A. & F.R.I.B.A., London; Isitt, Herbert, A.A., Bradford.

Jackson, Charles Ed., London; Jackson, Charles J., Cardiff; Jackson & Fox, Halifax; Jackson, Francis W., M.A. & M.R.I.A.I., Cork; Jackson, Fredk., F.M.S., ; Jackson, Geo., London; Jackson, John, Nottingham; Jackson, T. G., M.A., Oxford; Jackson, William, Nottingham; Jacobs, Benjamin S., Hull; Jacques, William, Gloucester; James, James W., A. & A.A., London; Jenkinson, T. H., Sheffield; Jerman, James, A. & G.R.I.B.A. & A.A., Exeter; Johns, Samuel, Saltash; Jolley, Wm., Nottingham A.A., Nottingham; Jones, C. L. & Co., Manchester; Jones, David, Oldham; Jones, Edward, Wrexham; Jones, Edmund R., Plymouth; Jones, Herbert J., Bristol; Judge, Frederick, A. & A.A., Peckham-rye; Judge, George, F., London; Jurd, William, Southampton.

The Hon. Sec. will be glad to receive donations from 1s. and upwards towards the expenses of the Memorial, which have exceeded by 25*l.* the amount already subscribed, for which deficit the Committee are responsible.

THE BYRON STATUE.

THE statue of Byron, which, after much discussion as to a site, has at length found a resting-place in Hamilton-gardens, was unveiled on Monday last in what may be called a semi-private manner by Lord Houghton, no public announcement having been made of the occasion beforehand. The quiet way in which the ceremony was performed may perhaps be taken as an indication that the promoters are not so well satisfied with the whole result of the movement as to think it worth while to attract public attention to it particularly; and another reason may be that the statue rests at present on only a temporary pedestal. The whole history of the affair seems to show that, from whatever cause, there is a want of general sympathy with or interest in Byron at present. The two competitions failed to elicit any great work, and when the design (by Mr. Belt) was selected and completed the general feeling seemed to be that no person or persons were willing to let it stand on any site over which they had jurisdiction. The site now obtained is not a bad one in some respects; the statue will have a good light on it during the greater part of the day, though there is no special suitability in the position otherwise. The unfortunate point about the situation is that the view of the statue from the park drive is so much interfered with by the high railing of the gardens.

The statue represents Byron as a young man, seated, with his head leaning on his hand, and his favourite Newfoundland dog lying beside and looking up at him. We cannot think the attitude of the figure at all happy; it is in fact, from a sculpturesque point of view, almost awkward, and the likeness is not so striking but that it might be missed by many spectators, and in the case of a figure and face so marked in character, and so familiar to us from other sources, it ought to have been possible to produce a statue that would have been unmistakable. The idea of representing Byron apart from his literary character, merely as a melancholy youth, is quite reasonable in one point of view, and it may be doubted whether it would not have pleased him better to be represented as a man than as a poet; but at the same time, the interest of the nation in him is as a poet; and this dreaming youth is certainly not the Byron we associate with his most remarkable works. On the whole, we fear we can only regard it as another of the failures of our public statues, and sum it up with "least said, soonest mended."

THE HORSEMONGER-LANE GAOL SITE.

ESTIMATE OF ITS VALUE.

THE approximate value of the site of Horsemonger-lane Gaol came under discussion at its attempted sale at the Auction Mart, last week, when Mr. Ellis, of the firm of Messrs. Farebrother, Ellis, & Clark, who conducted the sale, compared it with the value of the site of the Queen's Bench Prison nearly opposite. This, containing an area of three acres, was recently sold for 45,000*l.*, being 15,000*l.* an acre; and, taking that as his guide, he considered that about 27,000*l.* or 28,000*l.* for the property he was then offering, containing an area of 65,340 superficial feet, would be an equivalent sum. Estimating the value of the property by calculating it at so much per foot per annum, he said that 6d. per foot, which he considered was a moderate sum, would amount to 1,600*l.*, representing, at twenty years' purchase, the sum of 32,000*l.* The property was put up at 18,000*l.*, that being the first offer, and by advances of 500*l.* the sum of 23,500*l.* was reached, when the biddings ceased, and the auctioneer having named 25,000*l.*, the site was withdrawn at that sum. The local authorities south of the Thames, and others interested in the site being converted into a recreation-ground, have thus another opportunity of securing it for that purpose.

Hampton Court. — The *Richmond and Twickenham Times* remarks that whoever is responsible for the decent cleanliness of the South Gallery at Hampton Court Palace should be packed off to Amsterdam and forced to take a lesson from the exquisite cleanliness of the carved marbles in the King's Palace. At Hampton Court the carved marble mantelpieces have their graceful and delicate figure-work so abominably dirty, that a great part of its beauty is obscured.

STOUGHTON GRANGE, NEAR LEICESTER.

ON the site of the present mansion formerly stood the grange of Leicester Abbey, from which, in 1552, at the Dissolution, it passed into the Farnham family, and thence, in 1739, to the Kecks, the ancestors of the present owner. In 1860 the last of the original Kecks died, and the estates devolved upon the Hon. Harry Littleton Powys (fifth son of the late Lord Lilford), who added the name and arms of Keck to his own grandson. Mr. H. L. Powys Keck is the present owner, and has rebuilt a great portion of the house, as shown in the drawing, pulling down a great part of the old walls. These walls were but a mass of rotten timber and brickwork, with loose rubbish, in which were found some few fragments of the fifteenth-century work belonging to the abbey buildings. The materials used are thin red Suffolk bricks specially made; the dressings are of Ketton stone, with panels carved in red Mansfield stone, and Westmoreland slates are used for the roofs and spires. In the gables are introduced the Powys and Keck mottos, with the arms and crests.

The ground floor has the two drawing-rooms and the dining-room *en suite*, making a total length of about 120 ft. All these rooms have wainscot oak fittings and floors, with rich plaster ceilings in the sixteenth-century style. The offices have been also, to a great extent, rebuilt and altered.

The work generally has been done by measure and value; Messrs. Haycock, Mr. White, Mr. Fozzard, and Mr. Murrel, being the local tradesmen employed, while the oak fittings and floors, and all joiners' work are by Messrs. George Trollope & Sons, and the ceilings by Messrs. Jackson, Mr. Hibbins being the clerk of the works.

Mr. R. Herbert Carpenter and Mr. B. Ingelow are the architects.

LEON CATHEDRAL, SPAIN.

DON JUAN DE MADRAZO.

A SHORT time ago there died, a victim, it seems, to anxiety and vexation, the most accomplished and high-minded architect in Spain, Don Juan de Madrazo, the talented director of the restoration of Leon Cathedral. In our own country, and in France, a work on such a grand scale is no novelty, but in Spain, where things are left pretty much to take care of themselves (the Alhambra excepted), or now and then patched up by unskilful hands, this restoration at Leon is a most remarkable work; and to have carried it out in the skilful manner he has shows that Don Madrazo was an artist and architect of the front rank.

Leon is rather an out-of-the-way place to get to, but no architect visiting Spain should omit to go thither. Its cathedral has been so well and carefully described in Street's "Gothic Architecture in Spain" that it is unnecessary for me to say more than to draw attention to those peculiarities of the construction with which Don Madrazo had to deal, and with such signal success.

The cathedral, begun just at the end of the twelfth century, was in progress till the beginning of the fourteenth century, its western towers being later, and added in the fifteenth and sixteenth centuries. Its plan, and indeed its whole design, is thoroughly French, of the Geometrical period (a style, however, not really suited to the intense sun light and heat of Spain as the Catalonian style, as carried out in the most noble cathedral of Barcelona). The whole idea of the original design was to get great windows, and with this object the piers and buttresses were reduced in size to a minimum, there being but an excessively small pier between the six high windows of the clearstory, only just wide enough to receive the vaulting ribs and the slight arches of the flying buttresses. Owing to some faulty or careless construction, the design had to be altered soon after its execution, and the two outer lights and part of the tracery had to be filled in with stonework (as the sketch shows) as well as the corresponding openings of the triforia, thus marring the original design. Even with this alteration the effect of the great windows with their rich ancient glass preserved entire, is most beautiful. Portions of the aisle windows were filled in in later times, doubtless because the flood of light was unbearable.

From the original weakness, decay was continually threatening. The north side and cloister were just restored or rebuilt, and in wretched taste; but when Don Juan de Madrazo was appointed by the Government to take up the work of rebuilding the south transept, he most carefully set himself the task of carrying out the original design by reconstructing the buttresses and piers on the ancient lines and details in such a manner that they are strong enough to allow of the windows and triforium being exactly reproduced to the full widths they were designed. The artistic skill and the science shown in such a reproduction as this is by Don Madrazo must place him amongst the most notable of European architects.

A correspondent, "L. T.," in a recent (April 21) number of the *Guardian*, gives most interesting particulars of his visit to Leon and acquaintance with the talented architect. Don Madrazo had spent much time in England, and spoke our language fluently, and was well acquainted with our literature, frequently studying in the British Museum. At fifty years of age, after much local opposition and anxiety, he passed away, his last words being of his beloved cathedral,—"What will become of the cathedral I do not know; unless some good foreign architect is brought over, I see little chance of the restoration being finished."

R. HERBERT CARPENTER.

ST. MATTHEW'S CHURCH, OXHEY.

THIS church, of which we give an exterior view, is situated close to Bushey station on the London and North-Western Railway. It is now in course of erection, and is chiefly built of red bricks, and will be covered with Broseley tiles. The wall spaces inside are of the grey bricks produced in the neighbourhood of Luton and Hemel Hempstead; the red bricks being used as a dado, also in the arches and reveals and throughout the chancel. Most of the internal masonry work is of Portland stone. The architect is Mr. W. H. Syme, of Watford; and the contract has been taken by Messrs. G. & J. Waterman, builders, of the same town.

THE GRÄFE MONUMENT, BERLIN.

IN the long roll of benefactors to suffering humanity, the name of the late Professor Albrecht von Gräfe, the eminent oculist, will continue to be mentioned with grateful reverence. That most precious faculty concentrated in the human eye, bestowed upon man to convey to his inmost mind the beauties of creation, the phenomena of this world,—that "crystal to which no jewel is equal,"—was chosen by Gräfe as a fit subject for the exercise of his benevolent activity. For twenty years he made it the special object of his life,—alas! too short for those of his fellowmen who suffered under that most dire infliction, impairment of sight,—to free it from dimness or the consequences of injuries, to save, preserve, and restore it to such as had injured or lost it; how he succeeded in his art, to an extent scarcely paralleled, is matter of medical history.

Gräfe was born in 1828, at Berlin, inheriting a name already honourably known in the medical world. In close association with his life-long friend and co-worker, Dr. Waldau, young Gräfe studied and worked at the principal surgical schools in Berlin, under Dieffenbach, at Göttingen, Prague, Vienna, and especially at Paris, acquiring at a comparatively early age a rare amount of learning and practical knowledge in all branches of anatomy, physiology, and operative surgical science. His studies in Paris were especially fruitful, and shaped the course of his future sphere of activity; here he formed the resolution of devoting himself to a speciality, the treatment of the eye.

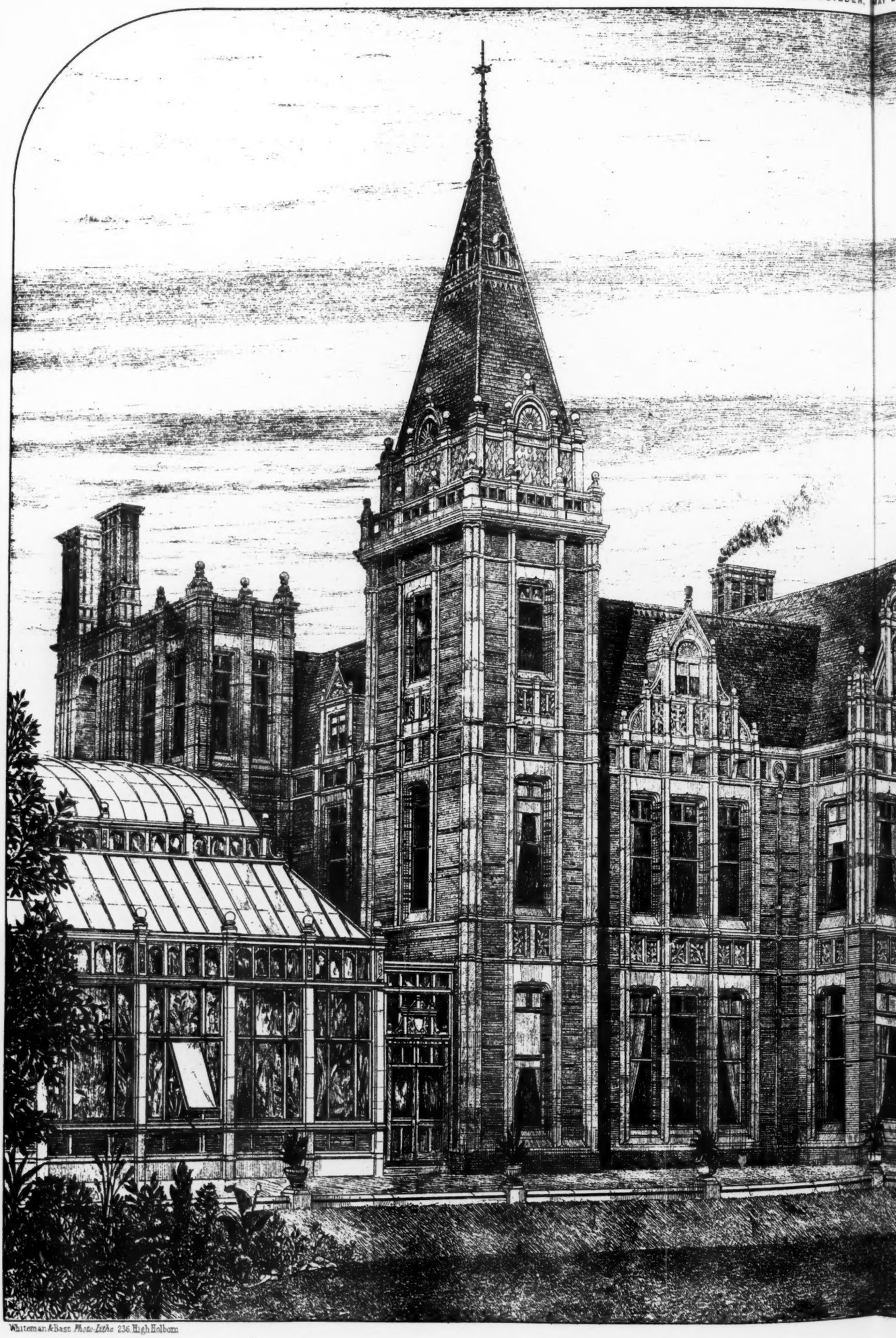
French science and practice had already amply prepared him for this branch of study. On returning with his friend Waldau to Berlin, there to utilise the results of his various studies, Helmholtz had just then completed his great invention, the eye-reflector, whence dates a new epoch in ocular science, and the art of relieving and restoring impaired eyesight. The great progress made in optical science came to their aid, and, provided with all the means, intellectual, scientific, and mechanical, necessary for their special branch, the two young oculists soon succeeded, in their private ophthalmic hospital established in the Behrenstrasse, in gaining eminent success by happy cures. The reputation of Gräfe soon spread beyond the borders of Germany, his circle of activity widening in the same degree, and sorely taxing his powers of endurance.

Gräfe's slender, somewhat bent, figure, the noble pale face with dark beard, and the handsome, melancholy, blue eyes, overshadowed by straight dark hair worn somewhat long, conveyed the impression of belonging to a sufferer, but at the same time as one elevated above the ills of this world. But this delicate figure, looking anything but robust and made for work, proved what a feeble organisation, inspired by great determination, pure love for humanity, disinterested goodness, and a passion for science combined, is able to achieve even under great personal suffering. With the germs of a mortal disease in his lungs, he would never consent to diminish his over-activity, until at last a very heavy illness compelled him to abstain from all work for some time. As universal as the great sympathy had been on the part of Berlin, rich and poor, during his dangerous attack of lung disease, so was the joy when his recovery became known. Once more Gräfe returned to his old duty and his wonted activity; but, unhappily, not for long. His old complaint returned, and carried him off at the early age of forty-two. To say that Gräfe died greatly lamented is to express in but poor language the grief that was felt by all classes at his premature death.

We fear our admiration of the man has already carried us somewhat beyond the scope of the *Builder*. It is time to return to the cause of our digression, the monument erected to Gräfe by a grateful community. Soon after his decease, in 1870, a wish was loudly expressed, at first among his more immediate circle of friends, then among the public at large, to honour the memory of a man so eminent by a public monument. The sums required for its erection were contributed by the profession not only of Germany, but of Europe, and America also was anxious to participate. A design by the sculptor Siemering, of Berlin, was selected, and has just been completed. The whole monument is of an original description, differing from the accustomed style of such memorials. With the co-operation of the architects Gropius and Schmieden, Siemering was able to create an architectural composition and a background, as shown in our engraving. A central portion, of a height of about 20 ft., is flanked by lower walls, and bounded on each side by pilasters. The middle portion contains a niche, forming a half-cylinder, and surmounted by a semi-cupola, its sides being covered by patterns in relief in greenish majolica. The statue of Gräfe itself is above life-size, and in bronze. Up to its middle height it is backed and half surrounded in a semicircle by an artistically executed lecturer's chair. This was a happy idea. The sculptor thereby gained the advantage of being able to mould his subject in the plain garb of a modern citizen, and at the same time avoid the fatal impression of slenderness and emptiness towards the base. The figure stands, resting upon the left leg, the right slightly advanced, the right hand in the opening of the breast of the buttoned coat, in the left, held down, an eye-reflector. The slightly-inclined head is said to be of life-like execution.

An original artistic charm is imparted to the monument by the two pictorial friezes, inserted in the flanking walls at a height of about 7 ft. They are in terra-cotta of natural colours, the impression of relief being produced by merely tracing the outlines in the backing. The figures in the frieze to the left of the beholder represent groups of blind led by friends to the helping hand that is to give them relief; to the right, the same groups, expressing by their gestures of joy and thankfulness that they have not come in vain. Siemering's work is much admired. The favourable impression produced by the whole monument is heightened by the pleasant background of trees and shrubs, which form the garden in front of the Berlin Charité, at the south-eastern corner of which, where the Luisenstrasse crosses the Schumannstrasse, the monument has been placed.

"Industrial Food Supply."—The Manchester Hotel Company has started an eating-house and kitchen under the above title, with the object of supplying the working classes with really good food at prices not higher than those they already pay. The premises are situated in Cloth-fair, and are within a few yards of factories where thousands of workpeople are employed. The Manchester Hotel Company are to be congratulated upon supplying a want long existing in the neighbourhood.



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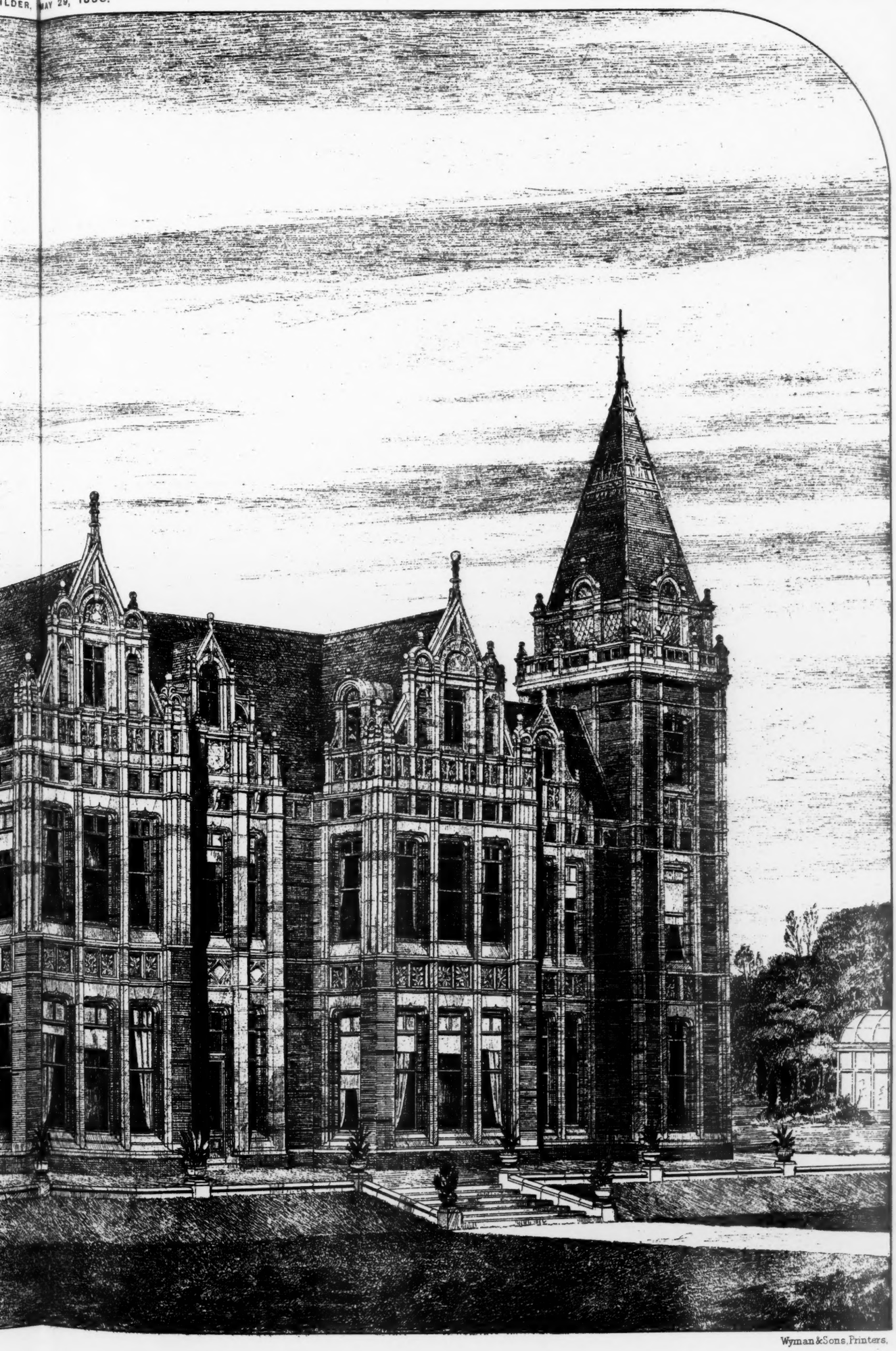
STOUGHTON GRANGE, NEAR LEICESTER.—MR. R. H



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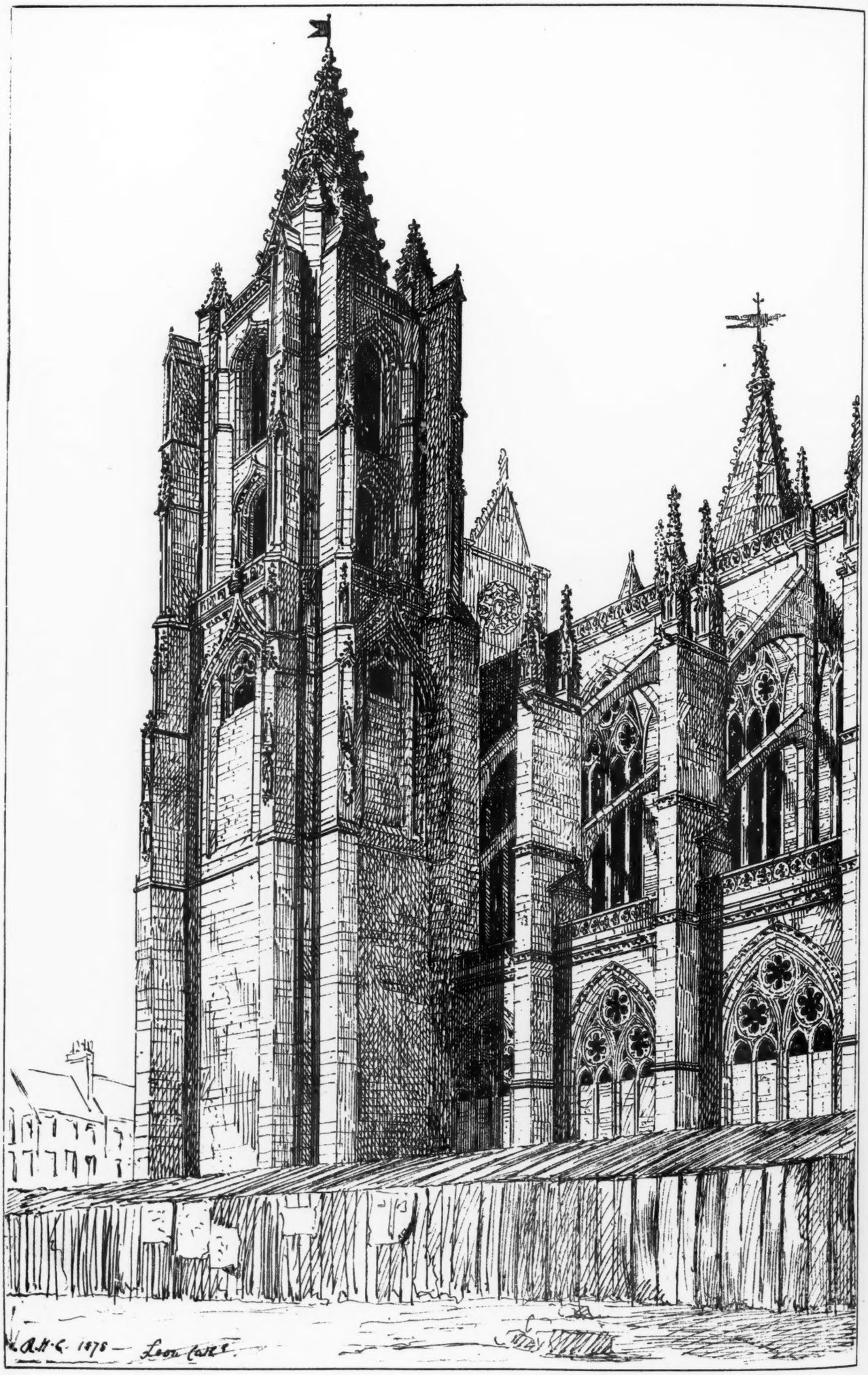
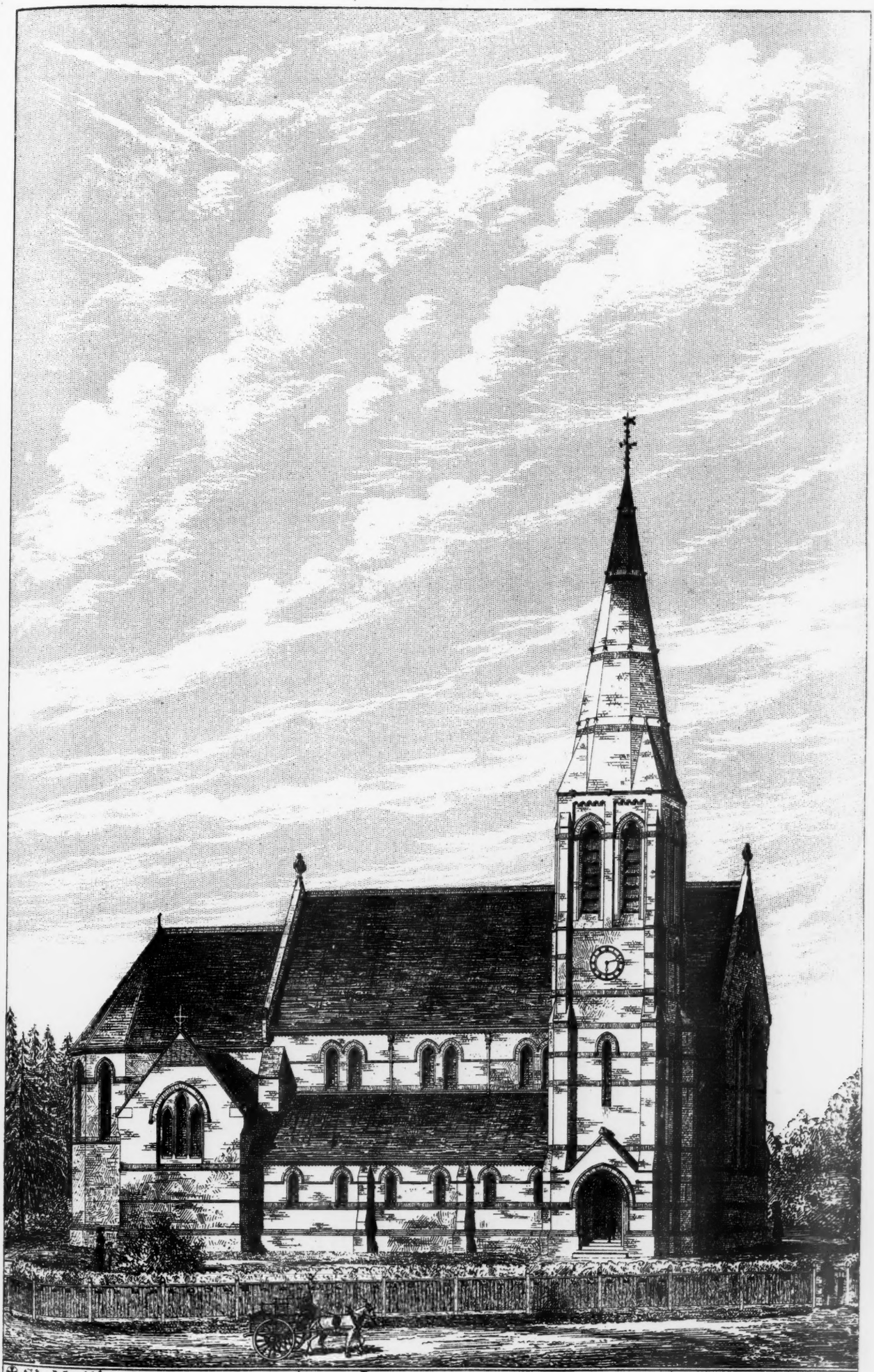


LEON CATHEDRAL, SPAIN.——From a Sketch by Mr. R. Herbert Carpenter.



St. Matthew's Church Oxhey. W. H. Syme, A.R.I.B.A. Architect Watford.

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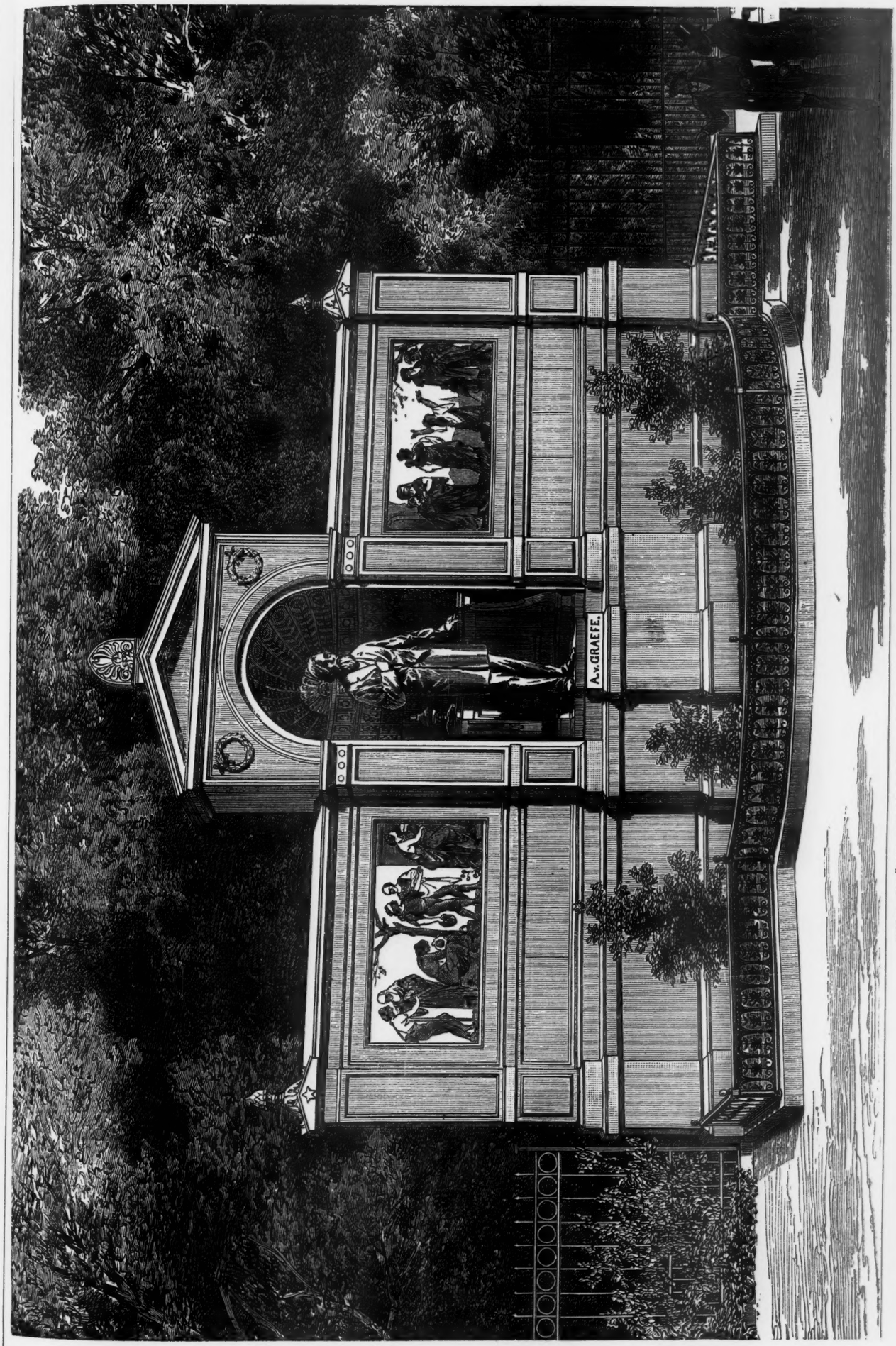

THE GRÄFE MONUMENT, BERLIN.—PROFESSOR SIEMERING, SCULPTOR.

SIZE AND PROPORTION.

SIR,—A point is incidentally raised in your interesting paper on "Sculpture in Relief" (*ante*, p. 560), which it will be a great service to the art world to elucidate. "A figure," is the phrase to which I refer, "always appears somewhat slenderer in its relative proportions according to the degree in which it is diminished in scale." I do not write either to oppose or to support this view. The subject is one to which I have given attention for more years than it is necessary to count. But it is one as to which, so far as I can gather, very little is definitively known. It will, therefore, be of much service to many of us if the thoughtful writer of the article, to many of whose opinions I unhesitatingly adhere, will give us the ground of his opinion. In the case to which he refers of the mechanical reduction of statues it might be possible to obtain exact comparison by means of photography.

It was precisely on this question of reduction by mechanical means that the subject first seized my attention. You may remember that in 1835 an artist of the name of Cheverton produced exquisitely-finished statuettes in ivory by mechanical means. The cutting tool used had a rotary motion, which gave to this finest of all the sculptor's materials a surface texture closely resembling that of the human flesh. I was at that time beginning to carve in ivory myself, and I made the acquaintance of Mr. Cheverton, in order to ascertain what I could as to the avoidance of facets, which are the great trouble of the ivory-carver. It is, of course, easy to give to the work a brilliant polish, by the use of powdered chalk and water and a brush; but the chaste delicacy of the material is entirely ruined when this vulgar expedient is adopted. Mr. Cheverton looked with interest at some of my work,—reliefs not larger than gems,—and then put the question,—"Do you think that in reducing a figure the exact proportion should be maintained?" I said I thought not, but that it was only a question of feeling, in my mind. "And I think not, too," said he. "But how to ascertain the proportion!" "Here," he was good enough to say, "you beat me. You execute a reduced figure with artistic truth. I execute it with mathematical truth, and I am artistically wrong."

These words sank in my memory. Much later, when the fine bronzes of Barbedienne attracted so much attention, they recurred to my mind. The same figure, reproduced in sizes, was not the same in its effect on the eye. How far this may be due to the fact that there is a most fitting size for every design, and how far to the absence of a certain subtle delicacy of proportion, I cannot say. But this one experiment I made. I selected one of the most perfect intaglio gems from the fine collection of the British Museum. I took advantage of the great boon which that institution offers to the artist in providing him with casts of its gems and medals at a merely nominal price, and I had the cast enlarged by the camera. The result was a figure of hideous disproportion. But it was not the case that the figure thus enlarged appeared more broad and stumpy than the original, which the remark before cited from your pages would indicate as the result to be expected. The distortion occurred in the increased size of the head and most prominent features of the body. These, to which the Greek gem-cutter, with the unrivalled instinct of his art, had given just those proportions which held the eye, and gave at once motive and symmetry to the figure, were, it thus became evident, in point of fact, disproportionately large. It seems to follow that if a life-size statue or relief were mechanically reduced to the size of a gem, the effect would be poor and insignificant.

One of the gems which I selected as giving the most delicate and effective representation of the nude male heroic figure was the well-known intaglio of Theseus and the Minotaur. Dividing the whole height of the figures into 960 parts, the head, according to the canon of Polycletus, should occupy 120 of those parts, in vertical measurement. Taking the trunk of Theseus to be determinative of the normal height of the figure, as contemplated by the artist, the head of the intaglio measures 160 parts, instead of 120. This is a distortion of 33 per cent. The hand of Theseus holding the club, and the outstretched foot, are apparently as much distorted.

Of the great importance of an accurate knowledge as well as sense of proportion, allow me to offer another example. The head of the Venus dei Medici is, it is well known, so unduly small as to give an air of insignificance to the physiognomy of what is, in other respects, one of the most perfect models of female symmetry. Measured by the rule before given, the height of the head of the Venus is only 105-960th parts of the height of the figure, instead of 120 such parts. On the the other hand, the height of the head of that noble figure called the Venus of Melos, is 121 of such parts. The average height of the male head, according to Quetelet, is 129-960ths of the height of the figure; that of the female head, 135-960ths. I speak with less preciseness of the width of the head, because my measurements are mainly those of girth, not taken horizontally, by callipers. But it is easy to see that the width of the head of the Venus dei Medici, if the proper proportion is observed, will be one-seventh too little, or thereabouts. The proportion of height to width in the best models is about as 120 to from 70 to 80. If this proportion be borne in mind, it will explain a certain want of perfection in what seems to me one of the most beautiful examples of drawing and colouring on which my eyes have ever rested, the Psamathe of Sir F. Leighton, No. 614, in the Royal Academy Exhibition; although, as remarked in your pages, it is rather a picture for the studio than for public exhibition. I have not had the opportunity of laying a pair of callipers on the painting; I speak from eye alone, and therefore under a correction which I shall be glad to receive from the President. But as far as my eye judges, the head of Psamathe is too small. I should say it is as much too small as is that of the Venus dei Medici. Perhaps Sir F. Leighton took that very proportion for his guide. But the result is the attribution to the exquisitely-modelled figure of a degree of,—I do not like to say, animality,—but I know no other word which will well express what I mean. If a rich braid of the golden hair were wound round the small head of the nereid, even if it involved the covering of the exquisite shell-like ear, I think the figure would compare favourably with any drawing of the nude from the hand of any master of the art of painting. But the departure from the Greek canon has, if I am not much mistaken, avenged itself in this instance.

Another illustration of the paper in your columns to which I refer was to be seen in the sculpture gallery of the Exhibition. It is not, perhaps, altogether fair to single out one or two specimens for admiration or the reverse, but yet the effect produced on the mind of a visitor who goes, not to criticise, but to admire as much as he can, is perhaps worth mentioning. I refer to a specimen of modelling, which was not by an English exhibitor,—a gold medal. The relief was so much too high for the size of the work as to destroy the delicacy of the work. The medallist might say, are there not Greek medals, and are there not Papal medals, in as high relief? I reply, Yes, and No. There are medals of the highest order of art in which the relief in parts approaches to the boldness of the round. But it is in parts alone, while the exquisite delicacy with which other portions of the outline die into the ground gives a special meaning to the prominent features. Very low relief, especially in a profile, and accentuated relief, here bold and there fading, have both been adopted with the happiest result by the great masters of cameo and of intaglio. High but unmodulated relief is, to my view, a fatal mistake, and vulgarises a medal to such an extent as to obscure the real merit which the workmanship may in itself possess.

TOREUTICOS.

Presentation to Lostwithiel Church.—Whit-Sunday was made the occasion of inaugurating a memorial pulpit which has been presented to the parish church in memory of the late Mr. William Collins and his wife by their family. The pulpit is of Decorated Gothic character, the drawings having been furnished by Mr. Clark, and the work has been executed by Mr. Harry Hems. A brass plate let into the stone base bears this inscription:—"Erected to the glory of God and in loving memory of William Collins (thrice mayor of this borough) and of Jane, his wife, by their children, 1880." The pulpit stands upon a stone base. Its main portions are of wainscot oak, and on plan it assumes the form of an irregular octagon, boldly buttressed at the angles, and with all its various cants fixed by double-membered and flowing tracery.

VIBRATION AND LIGHT.

SIR,—Mr. W. Cave Thomas, in his letter on "Vibration," has struck the key-note of colour-science. Too little attention has been directed to the scientific question and too much to the appearance presented by pigments, whence the result has been to enunciate so-called "principles" as regard chromatic effects, which are frequently erroneous, since they have no scientific basis.

This is illustrated in that great stumbling-block to true harmonious or melodious juxtaposition of colours,—the "complementary" colours. Scarcely any two authorities agree as to the "complementary" of the so-called *primary* colours, owing greatly to the confusion caused by colours being considered physically, visually, and chemically all in the same breath (take, for instance, the effect of combining blue and yellow lights,—the *impression* produced being that of WHITE,—and that of combining blue and yellow pigments,—an *impression* of GREEN being recorded by the sensorium).

The greatest error of all in studying colour phenomena is in not looking upon the diversity of colours as a *sensation*. Another error has been to confound the separation of *vibrations* by the prism as the separation of colours. Now, as I have endeavoured to show elsewhere,* every pure ray of colour,—and the number of colours is infinite,—has a distinct rate of vibration by which the impression of that colour is made manifest on the sensorium. We have been too ready to accept the number of colours as being limited, simply because the glass prism is sufficiently delicate only to separate the rays of seven colours distinctly. Now, has it never occurred to any investigator that the *material* of the prism, and the method of its manufacture,—the fusion, expansion, compression, and subsequent heating processes it has undergone before being delivered as a piece of glass to the hands of a cutter, to be cut in shape of a prism,—must be the chief cause of these seven "prismatic" colours only being so distinctly separated? In fact, we find, with a prism made of another kind of substance, the *order* of the colours is altered. Again, do we not find that a piece of glass that has had a certain chemical body,—one not essential to its manufacture,—added to it has so altered its structure that the vibration of only *one* colour is approximated, and hence the effect of sunlight passing through sheet-glass on to objects beyond is to modify their appearance by its influence? From these three facts alone we see that it is the *material and structure* of the glass that limit the production, or, I should say, exhibition, and hence impression on the sensorium, of different colours. This being so, we must dismiss the old, familiar idea of three, or, as some say, two, "primary" colours in favour of considering every distinct colour appreciable as a primary, or else believing in two extreme colours,—*i.e.*, red, of slowest rate of vibrations and nearest related to light, and blue, of quickest vibrations and nearest related to negation or absence of colour,—and the intermediate ones being due to the interference of the waves of the two extreme colours.

Thus, in music, a beat is produced by striking two notes, as two tuning-forks, not in harmonious relation, whence the vibrations or undulations propagated to the surrounding air by one fork are interfered with by the undulations or waves given forth by the other. At certain periods the undulations from the two forks will travel in unison, and an increase of sound is the result. At others, the rate of vibration or length of undulation being dissimilar, the travelling-forward particles of air of one wave will meet with the returning particles of the other; in more familiar terms, the "crest" of one wave meets the "trough" of another,—this requires pictorial representation,—and the result is a diminution of sound. Now, applying this principle of sound to colour, may we not look upon the colours intermediate between our chosen extremes, red and blue, as being due to the following cause? The extremes both start from a common centre, but meeting with objects differing in physical and chemical structure, the two rates of vibration, which, if allowed to travel uninterruptedly, would produce a sensation of red and blue respectively, are so interfered with

* Principles of Colour applicable to the Arts.—*Furniture Gazette*, March 27th, 1880. These papers were written as a synopsis of colour and its present state amongst authorities. Not that I consider many points touched on there are indisputable or true; for instance, Fuseli's scheme of "equivalents," or the question of "complementaries."

as to cause (not "beats," but) colours other than red and blue; and the difference in intensity of tone to the amount of interference experienced. Mind, I do not hold myself as bound to this idea; for no one can positively say at present what is the necessary physical condition for certain colours to be represented, but I give it forth as an idea worth expression, to see if it will hold good, or not, as the case may be.

Concerning the so-called *absorption* of rays, I have long looked upon it,—although I say so in face of many great authorities,—as a misleading term. Were Young's explanation of "the colours of thin plates" applied to this point, I have no doubt it would be found that the so-called disruption of one colour by another is due to the interference of the undulations. In this way:—If the spectrum be thrown on to a coloured instead of a white material, all the spectrum colours will be quenched but that one of which the material is coloured: thus, if the material be red, the red spectroscopic colour only is appreciated by the material, and the sensation of red received by the brain. Now, instead of the blackness exhibited by the other rates of vibration falling on the material being absorbed by that material, should we not consider they are reflected, but the reflected vibrations so interfered with that the "trough" of them meets with the "crest" of the incident vibrations, and negation of effect is the result, or, in other words, blackness?

So much for the physical points. Let us now consider colour physiologically, the point from which *harmony* should be considered. First of all, let us get a clear notion of what a "sensation" is. (1.) Mayne describes *sense* as "a faculty by which a living being receives the impression caused by contact with external objects, according to the organ involved"; (2.) the *sensorium* "the organ which receives the impressions made on the senses, the brain"; (3.) *sensation* "the consciousness of the approach of any foreign body from its contact with the extremities of our nerves being communicated to the *sensorium*."

Now, our present knowledge does not inform us whether a sensation is conveyed along the nerves in a series of *undulations*,—which is the more generally accepted theory, only, however, from its being the older one,—or by a chemical modification or reaction of the tissues. We know our blood and tissues are continually decaying and being renewed, and therefore we may equally accept this as the true conveyance of sensations; but how the brain receives and records them we cannot say.

Now, in all decoration by means of colour an appeal is made to our senses, while in pictures the colour appeals to our senses, the subject and treatment to our emotions, a fact too often overlooked through insufficient analysis of their own feelings by many. A correspondent of one of your contemporaries says, "Music is to poetry what colour is to form, a powerful assistant, but of itself having no meaning." Now it has a meaning, and a most distinct meaning, regardless of form. This is easily verified by having the form or outlines of the decorations of a room traced in black and white, and then the forms successively painted with harmonious colouring, and observing the effect on the sensations according to the prevailing tone or colour-effect. For, by means of the colour chosen, many and diverse feelings or sensations can be produced. This, then, is the physiological action of colour, and the one that should be studied by all decorators. It is their province to study this physiological action in preference to the unmeaning question of "complementary colour," "equivalent proportions," &c., for many pleasing and charming effects can be produced by the juxtaposition of colours that are in no way complementary, and, in fact, according to their law, would be denounced as ugly, simply because they did not follow a prescribed rule, one perhaps laid down in utter disregard of the question of sensation or feeling; whilst many, strictly following the rules of compensation, &c., produce but very little sensible or pleasing effect on our feelings. A person of fine organisation, and who is of a nervous temperament, cannot bear the slightest noise, adverse discussion, or annoyance in any form, without having his nerves jarred. Who has not likewise experienced a disappointed feeling when in the execution of some brilliant musical composition, a note has been wrongly struck? In a similar manner are the feelings of a truly æsthetic person jarred and irritated if his eye alight on some piece of colour composition, be it a decorated wall, a carpet, or a picture, in which there is the slightest hitch or fault in the colouring. Good decorators know this, for how often do they not have to practically feel the effect of the colours they use, no matter how true the theory of their scheme might have been on paper? How many trials of colour or tones do they not sometimes have to make? At the same time, there is too much affected æsthetic feeling,—too much humbug and pretence of being enraptured at the sight of anything that has been pronounced to be "great." The spectator too often will not analyse his feelings to form an independent judgment, but take his cue from the popularity of the painter or designer (which may be thoroughly deserved or only obtained by patronage). This is discreditable to both artists and their patrons, for many a truly meritorious picture or design is apt to be unacknowledged as such if it is the work of a comparatively "unknown" man.

However, we are wandering. The chief function, then, of the decorator and artist is, after having mastered the physical properties of colour, to earnestly study this physiological action, since that is the point from which the greatest amount of pleasure is received from colour application.

Mr. W. Cave Thomas asks "why the angle of reflection should be constant, whilst the angle of refraction varies?"

In *reflection* the rates of vibration and length of undulation are not interfered with, and hence the phenomenon of equal angles of incidence and reflection.

I must perforce break off here, although I have a host more points to write about.

HENRY C. STANDAGE.

THE "ROMAN WALLS OF CANTERBURY."

SIR,—I have only just seen your 1,940th number (April 10th), or should have troubled you with a few lines before this, especially as you there invite any of your readers to ventilate the subject. Mr. C. Roach Smith also having politely sent me the third part of the seventh volume of the "Collectanea Antiqua," expressing a wish that I should make any observations I thought proper on the article, I am induced to draw attention to my paper on the "Discoveries at Canterbury," read before the Society of Antiquaries, London, April 8th, 1869, and published in vol. xliii. of the *Archæologia*; more especially to that part of it which refers to the extent and position of "Roman Canterbury" and its walls.

I doubtless had, in cutting deep trenches throughout every street and lane of the present city, a better opportunity and means of discovering ancient foundations and objects of antiquity than any one has ever had before, or is likely to have again. My profession would help me in one direction to form an opinion about walls, materials, and bearings, and my having been a Fellow of the Society of Antiquaries for many years would lead me to pay great attention to the archæological side of the subject.

In a plan of the present city which I made for the Society to show the exact position of various places at which objects were found, as well as to illustrate other points of interest, and which of course gave the accurate position and extent of the present or Mediæval walls and gates of the city, I endeavoured to suggest the probable extent and position of the Roman walls, which I believed to have been tolerably well ascertained by the crossing of a heavy Roman wall at so many places, and I think my observations and the position of Roman work discovered by me at once sets at rest any supposition that the present walls in any one place "are based upon the foundations and enclose the core of the Roman walls."

The Roman city seems to have been very much smaller, occupying an area of about 1,400 ft. by 600 ft. only, and that as nearly as possible in the centre of the present city; and at a little to the north of the centre of this area stood some massive and extensive buildings, probably the Roman forum, &c.

Within the line drawn by me on the plan there were no remains found of a burial of any kind, but very nearly indeed exterior to it, viz., at a point in the High-street, marked by me 54, was found, at a depth of 10 ft., a fine amphora, in its rather imperfect state measuring 2 ft. 2 inches high, and 17 inches diameter, containing forty-one Roman coins much corroded and illegible; but those which could be deciphered were of Carausius. This, combined with the facts that so many burials, by cremation and otherwise, were found exterior to this line, and none within it; that what appeared to be a heavy Roman wall was crossed in no less than six places; that at the two angles where it may be supposed the strong gates or forts for the entrance to the city from the Roman stations of Dover and Richborough respectively would be placed, extensive Roman foundations were found answering to such a purpose, will, I think, warrant us in believing that the course I have laid down for the Roman wall is nearly if not the correct one, and therefore the true extent of the Roman town is thus known, or in all probability can now never be; and that, if I be correct in my deductions, no part of the present walls stood upon the foundation of that of the Romans.

To understand and fully estimate the extent and interesting nature of the discoveries, the objects found, &c., I refer your readers to volume xliii. of the *Archæologia*, pp. 151—164, where what I have here briefly stated will be far better understood and appreciated.

JAMES PILBROW, M.I.C.E.

TRURO CATHEDRAL.

THE newspapers have given full and flourishing accounts of the ceremony of laying the first stone of the cathedral for Truro by H. R. H. the Prince of Wales on the 20th inst. We have before now alluded to the design; it will be sufficient on the present occasion to note that the architecture of the new cathedral will be Early English, with characteristics of buildings of the early part of the thirteenth century. The external features of the building are a central and two western towers, some deeply-recessed doorways, and windows of plain character. The entire length of the building from east to west will be about 300 ft. The interior of the choir will be 115 ft. The nave will be 165 ft. long, and about 76 ft. wide. From floor to roof the height of the interior will be 70 ft. The central tower will be the highest point of the building; from the floor-line to the weather-cock it will be about 224 ft. high. The materials will be Cornish stone for the walls and red tiles for the roofs. There were four competition designs for the Cathedral,—by Mr. James Hicks, Mr. J. M. Brydon, Mr. J. P. St. Aubyn, and Mr. J. L. Pearson. Those by the latter architect were selected. The cost of the entire cathedral is estimated at 95,000*l*. The choir (the first portion to be built) will cost about 35,000*l*. In addition to the building cost, the sum of 10,000*l*. has been paid for the purchase of property adjacent to the cathedral, and required for the structure. We may add that both the foundation-stones are of grey Cornish granite. There will be no contractor,—at any rate, for the present. It is intended to carry out the works under the immediate management of Mr. James Bubb, an experienced clerk of works.

BUILDING IN THE HOLY LAND.

IN a letter in the Austrian *Zeitschrift für den Orient*, Herr C. Schick, Government Surveyor of Buildings in Jerusalem, gives (says the *Times*) some interesting facts to show the progress which has been made in Palestine during the last twenty-five years. This is especially evident in the erection of many new buildings. In the small villages very few new houses are to be seen, while, on the other hand, great extensions have been made in the larger towns, a sure sign of centralisation. This is especially the case with the Christian population. In Jerusalem, inside the town, neglected or ruined houses have been restored or rebuilt by private persons or companies; outside the old town are entirely new suburbs, the extension being made especially towards the west. The Jews have formed among themselves building societies, which have erected long, barrack-like buildings adapted for several families. It may be estimated that the number of dwellings during the last twenty-five years has been more than doubled, probably trebled. This is especially the case with Bethlehem, which conveys the impression of a newly-built town. In Jaffa, the town-wall has been demolished, the ditch filled up, and a number of large new houses and magazines erected. So also in the gardens of Jaffa many new houses have been erected, and to the south and north of the town complete Arabic suburbs, mostly by settlers from Egypt. In Ramleh, also, new

houses are seen, still more in Kaifa, which Herr Schick hardly recognised again on his last visit. In the neighbourhood of this town is the new German colony, at the foot of Mount Carmel. Nazareth gives quite the same impression; the place has increased in size, and looks as if it had been rebuilt. Tiberias also has its new houses; in Jenin a new military arsenal has been erected, as also in Nablus, along with a fine new barrack. In the latter place the once lonely valley towards the east has assumed quite a homely aspect, and in the town are many new private buildings and also a new khan; there are also the new school, the Roman monastery, and the buildings of the Protestant mission. In Bethlehem a new barrack and arsenal have been erected. New houses are also to be seen in Jifne, Ramallah, Beit-Jal, Beit-Sahur, and other places. Through the schools and the increasing trade the working people have acquired greater style and taste, and the newer houses are thus mostly a great improvement on the old,—not the oldest, which, as a rule, are well built. Nearly all the houses have now glass windows, a rare thing twenty years ago. The aqueduct, which brought the spring water in the olden time from the so-called Pools of Solomon to Jerusalem, has been again erected so that it discharges at the place of the Temple. A very notable advance is seen in the lighting of the streets of the towns, and the arrangements for keeping them clean; in the latter respect, however, there is still much to be desired. No longer are the gates of the towns shut at sundown, to the obstruction of trade and the imprisonment of the inhabitants within the walls. There has also been a great advance in the paving of the towns; in Bethlehem even in the winter-time the streets are quite passable, which was far from being the case formerly. In Jerusalem, the tanneries and the slaughter-houses have been removed outside the town. On several buildings clocks have been placed which strike the hours for the public benefit. In Jerusalem the sanitary department is in charge of a German physician, and building affairs are in the hands of a German architect.

THE ROYAL ARCHITECTURAL MUSEUM.

MR. J. P. SEDDON delivered the last of his series of lectures entitled "Caskets of Jewels" on Tuesday evening last, and took occasion to refer to the Museum itself, with regard to its capacity for the education of the student architects who go thither to learn the details of their profession, and of the workmen who, under them, will have to execute similar details. The very bringing of these students together was in itself a desirable work. He thought that the Museum might fairly be considered as a pioneer in the direction of the present most important movement for technical education, and that it might and should be made its very centre. Such, and no less, was what its zealous founder, Sir Gilbert Scott, intended it to be. Its central position, close to Westminster Abbey, and its convenience for the working classes; its large and valuable area, secured for nearly half a century to come (by the recent purchase of the reversion of the lease held under the Ecclsiastical Commissioners, at a cost of 500*l*., that had unfortunately exhausted all its reserved funds), marked it out for such a purpose. Even within its present area, a moderate expenditure could largely increase its capacity for artistic instruction, and there was the possibility of obtaining adjoining premises which could be made the site for the art schools which were so much needed in the neighbourhood of Westminster. Many and valuable schools for drawing, modelling, and design had been and were being founded, it was true, elsewhere in the metropolis and provinces; but where were their necessary examples for study? They had to send to the Architectural Museum for them, and to content themselves with a modest selection of copies from its vast and varied stores. The Museum had just sent off one such to Sheffield, where art was fostered under Mr. Ruskin's care. Another was being prepared for the Lambeth Technical Art Schools. But no other school could house even a hundredth part of the marvellously comprehensive collection contained in the Museum, nor, within a century to come, were opportunities likely to occur for the formation of another such collection. Take, for instance, the extensive and beautiful set of casts from Venice and Verona, formed under the direction of Mr. Ruskin on the spot, and not confined to a few show-pieces or specimens, such as might be seen at South Kensington, but an exhaustive series of all the parts thought best and most useful by that eminent authority. Or, again, take the splendid series of casts taken under the care of Mr. Ferrey during the recent restoration of Wells Cathedral. Such casts must remain as unique as they were excellent and useful, and so must those taken during Sir Gilbert Scott's exceptionally fortunate career from cathedrals and churches in all parts of the United Kingdom. The very cost of the scaffolding required to obtain duplicates of such casts would prove prohibitive. Such things as he had named were but samples of the unique treasures of the Museum, which, he took it, were eminently and specially technical, and the very things most wanted in the present day for the advancement of decorative art.

PRINCIPLES OF VALUATION.

AN appeal against the assessment of Messrs. Bass's breweries, at Burton-on-Trent, came before the arbitrator, Mr. A. Staveley Hill, Q.C., M.P., at the Institution of Surveyors, Great George-street, Westminster, on the 7th inst.

Mr. Edward Ryde, the well-known surveyor, was the first witness called. In answer to Sir Henry James, he said he had carefully gone through the premises in question, and valued them for rating purposes. He then gave a detailed description of the internal arrangements and plant of what is called the Old Brewery, but which is in reality the New Brewery, having been rebuilt of late years. His principle of valuation, he said, was to divide the Old Brewery into as many parts as there were separate buildings, and to estimate the annual rent which a tenant might be reasonably expected to pay for it as a brewery, having regard to its situation and the use to which it was put as a Burton brewery. With regard to the buildings themselves, he first calculated the floor-space, and divided it into 10 ft. squares, taking as his standard one such square 15 ft. high, at 33s., of which 3s. was for ground-rent. He only calculated ground-rent for the first two floors. He knew a large building in the City covering 12,000 square feet. Over the whole of it there was a ground-floor for warehouses, and over one-fourth of it there were houses with three or four extra stories. The effect of taking the structural value, and adding ground-rent, would be to put a very large ground-rent on that part which had no story over it. That mode of valuation for rating purposes must, therefore, be fallacious. The fact was, where only one story was built, the full value of the land had not been developed. The witness then gave in great detail the values which he placed upon the different parts of the Old Brewery, the total estimated rental which he set upon them being 4,140*l*., as against the assessed gross rental of 5,198*l*. There were in the assessment several things which ought not to be treated as rateable, because they were not attached to the building. The mash-tubs were simply fixed by their own weight. If a man were strong enough he might lift them up, just as he would a washing-tub in a private house. The receiving squares similarly stood by their own weight, and were removable if necessary. From these squares the wort passed to the coppers, which were built into the buildings themselves, the setting being solid brickwork, and he therefore treated them as rateable. The hopbacks were not rateable, because they stood by their own weight, but the hop-presses were rateable, as were also the engines, pumps, boilers, and tanks. The refrigerators ought not to be rated, because they were simply placed on a shelf, and in no way affixed. A new tenant might prefer a different patent, and could then remove them and replace them by others. The union casks were kept in position simply by a movable bolt, and therefore were not rateable. The large racking square, too, ought not to be rated, because it was retained in its position simply by its own weight. The rateable value was the sum a yearly tenant was supposed to give by way of rent, the landlord bearing all the expense of repairs, renewals, insurance, and all other matters of that description. Part of the building was insured, but there was a fire-brigade maintained on the works, the cost of which must be regarded as an insurance. The deduction under these heads allowed by the valuer for the Assessment Committee was, in round numbers, 25 per cent., but he had allowed 33⅓ per cent. This latter percentage was the deduction which was legalised by the Metropolis Valuation Act for property of this kind. It was allowed in the case of Whitbread's Brewery, and on that occasion Sir William Bodkin said,—"The Legislature meant us to take off one-third." It appeared to him that that was a fair and reasonable deduction. He had made inquiry into the actual cost for insurance and renewals. It would be most unjust to fix the rate according to the cost of the water-tower, because a great expense had been gone to in ornamentation, which would be of no use whatever to a tenant. In fact, in Surrey such towers are called "Follies," and in the same way this might be termed Bass's Folly. On the buildings alone, last year, 1,766*l*. was spent in repairs, though there was no exceptional expenditure; but acting on the principle of taking off one-third, he had only deducted 1,380*l*. under that head. That sum did not include insurance. The net rateable value, according to his estimate, was 2,627*l*., against the Assessment Committee's calculation of 3,900*l*.

The examination was continued by Mr. Meadows White, the matters gone into being the details of the Middle and New Breweries, the number of items, especially in the former case, being extremely numerous. Mr. Ryde's valuation of the gross rental of the Middle Brewery was 9,482*l*., as against the assessment of 12,999*l*.; and the net rateable value 6,322*l*., against the assessment of 9,790*l*. In the case of the New Brewery the figures were,—valuation, gross estimated rental, 6,510*l*.; assessment, gross estimated rental, 8,929*l*.; valuation, net rateable value, 4,340*l*.; assessed net retable value, 6,031*l*.

The hearing of the appeal was continued on the 8th inst., when Mr. Ryde gave further evidence, and on the 10th inst. he was cross-examined, at considerable length, by counsel for the respondents. On the 11th Mr. J. W. Penfold gave evidence in support of the appeal, as did Mr. William Sturge, of Bristol, and on the 13th Mr. Joseph Quick, jun., C.E. This concluded the case on behalf of the appellants, and Mr. William Marshall having given evidence on behalf of the respondents, the further hearing of the appeal was adjourned until the 9th of June.

PROPOSED RAILWAY IN THE WEALD OF KENT.

ON Wednesday, the 19th inst., a numerously-attended and influential meeting was held at Heronden Hall, the residence of Mrs. Curteis Whelan, to consider a scheme for giving railway accommodation to the Weald of Kent and Romney Marsh.

Mr. W. P. Burra presided, and numerous letters were read from landowners and others who were unable to attend, expressing hopes that the effort to obtain the railway would prove successful.

It was understood that the proposal originated with owners of property at Hawkhurst, and was for a railway commencing at a junction with the Cranbrook Railway, thence going in a southerly direction to Hawkhurst, and thence turning eastward and following the Rother levels past Rolvenden, Tenterden, Appledon, and Lydd to Dungeness. Besides these places, many other towns and villages, such as Sandhurst, Wittersham, Northiam, and New Romney, would be served by the projected line. It was stated that the railway would not only accommodate the district through which it would pass, but would also be of incalculable service to great numbers of ships which shelter at Dungeness during stormy weather, and would, moreover, shorten the time taken in getting from London to Paris by about half an hour, as Dungeness is the nearest point to Boulogne by some miles, and would bring the projected line within seventy miles of London. It also has the advantage of deep water close in shore, so that as soon as the alterations at Boulogne harbour are completed, large and powerful steamers could be employed which would reduce to a minimum the discomforts of the Channel passage.

Freehold Ground-Rent.—Messrs. Norton, Trist, Watney, & Co. offered for sale by auction, on Wednesday, a freehold ground-rent of 325*l*. per annum, secured upon the premises, No. 22, Great St. Helen's, Bishopsgate-street, let upon lease for a term of 99 years from 1862, the gross rack-rental being estimated at 1,800*l*. per annum. It was sold for 9,250*l*.

THE CONSTRUCTION AND MAINTENANCE OF HIGHWAYS.

AT the last meeting of the Liverpool Engineering Society a paper was read by Mr. Window, assistant surveyor to the West Derby Local Board, entitled "Remarks on the Construction and Maintenance of Highways." The author commenced with a sketch of the highways of Great Britain previously to the revival of the art of roadmaking. The first great roadmakers were the Romans, who laid down their vias with rigid foundations, employing both hand-pitched stone and lime concrete substructures, the latter chiefly in France. These roads were so admirably constructed that they had in many instances defied the ravages of fifteen centuries. Their peculiarity was their straightness, arising from the fact of their being suited to the vehicles of those times, which were without movable axles. After instances had been given of the dangerous and neglected state of the roads till the advent of Telford and Macadam, the various methods of constructing roads, including the use of lime and concrete foundations, were next commented on. Of the materials for road-metal, Guernsey granite, Penmaenmaur and Clu-Hill-Dhu stone, were recommended, and for footpaths, where stone was not cheap and easily obtained, the use of concrete flags, which have been found to answer very satisfactorily in towns where they have been laid down. In a comparison between the respective advantages of wood and asphalte, it was remarked that asphalte appeared to be the smoothest, driest, cleanest, best as regards repair, and possibly the longest lived; and wood the quietest, and one which afforded the easiest and safest pavement for horses, and the best adapted for gradients. Finally, the author insisted on the paramount necessity of thoroughly hard foundations for all roads except where they crossed marshy districts.

THE SCULPTURES OF PHIDIAS.

THE third of Mr. C. T. Newton's lectures* on Greek sculpture and painting to the students of University and King's Colleges was delivered in the Botanical Theatre of University College on the 19th inst. He observed that between the time of the end of the Persian War (B.C. 478) and the age of Phidias further progress was made in art by such artists as Pythagoras of Rhegium, Onatas, and Calamis, of whom no works remained by which their several styles could be identified. It remained for their immediate successor, Phidias, to profit by their careful work, and to surpass them. Having attained perfect mastery over the sculptor's materials, Phidias applied this technical skill to the representation of beauty, which he sought in nature and idealised by an effort of the imagination. This search for beauty by Phidias was not a mere vague yearning. Phidias had ever before his mind a practical aim. He had to create out of his imagination adequate fitting types of gods. From the beginning of their art the Greeks represented their gods in the human form, but at first very rudely and in combination with strange adjuncts and symbols. Gradually, as art advanced, these adjuncts and symbols were discarded, and the monstrous was eliminated from the type. At the time of Phidias a great change had been wrought in the religious feelings of the Greeks by the influence of successive schools of philosophy, who taught a doctrine about the gods opposed to the popular belief. In the eyes of the followers of these new teachers the quaint old time-hallowed idols must have lost much of their sanctity. The art of Phidias, presenting the great deities under new and more impressive aspects, and embodying them in types more worthy of the higher conceptions of divinity then prevailing, may be said to have contributed much to the reviving and spiritualising of the old pagan worship. Of the many works of Phidias the two most celebrated were the Zeus of Olympia and the Athene Parthenos at Athens, both of colossal size, and made of ivory and gold. We could only form a faint conception of the merits of these works by comparing the testimony of ancient writers in various ages, all of whom concur in ascribing to the art of Phidias a higher ideal character than to that of any other ancient artist. We had, however, some extant remains enabling us to judge of the qualities of Phidias as a sculptor in marble. These were the sculptures of the Parthenon, of which those that remained consisted of remnants of the pedimental compositions, metopes, and frieze. The frieze related to the procession at the Panathenaic festival held in honour of Athene every five years, on which occasion a new veil or *peplos* was presented to the tutelary goddess on her birthday. This procession consisted of cavalry, chariots, musicians, victims, and other groups, forming in its *ensemble* a sort of image of the Athenian State, in which the colonies and dependencies were also represented. We recognised in the figures on the frieze these several features of the procession as described by ancient authors. The lecturer then explained the groups of seated figures on the eastern side of the temple, which are believed to represent the gods of Athens assembled on the occasion of the delivery of the *peplos*. Great uncertainty, he said, existed as to the names of these gods, and from twenty to thirty different theories about them had been advanced. The metopes of the Parthenon were originally ninety-two in number, of which only eighteen survived in tolerable condition. Among the subjects of those which have perished seemed to have been scenes from a Gigantomachia, in which Athene took a part, and possibly scenes from the taking of Troy. The subjects of the sixteen metopes in the British Museum were scenes from the Centauromachia, in which the Athenian hero Theseus took a prominent part. The lecturer then described the two pedimental compositions. Here, again, the greatest diversity of opinion prevailed as to the interpretation of the several groups. The three female figures in the eastern pediment were originally called by Visconti the Three Fates. This conjecture had been recently confirmed by the discovery of an altar on which the Birth of Athene was sculptured in relief, and where the Three Fates were certainly represented. The lecturer concluded by a description of the chryselephantine statue of Athene Parthenos, which stood in the Parthenon, and on which Phidias had bestowed his utmost art as a toreutic sculptor, and on the adornment of which the Athenian people had bestowed an amount of gold equal in value to at least 115,000*l*.

* See p. 644, *ante*.

NEW TOWN-HALL FOR HOVE.

THE memorial stone of the new Town-hall for Hove was laid on Saturday last by Mr. J. W. Howlett, chairman of the Board of Commissioners. The building, which will cost 32,000*l*., is being erected from a design by Mr. Waterhouse, A.R.A. It is Gothic in style. The site is in West Hove, and about a quarter of a mile further away from the central part of Brighton than the old hall. It will have a frontage of 190 ft. in Church-street, a length of 142 ft. 6 in. in the Norton-road elevation, and a length of 67 ft. 6 in. in the Tisbury-road. It will have a three-storied central building, with right and left gabled wings, and a clock-tower over the main entrance. The great hall for concerts, balls, and other entertainments, will be in the central portion of the building, and will be 90 ft. long, exclusive of the orchestra, by 60 ft. wide, with end and side galleries, and will altogether afford accommodation for about 2,000 persons. On the ground-floor there will be offices for the town clerk and the assistant-clerk, a public room, a committee-room, a large and a small cloak-room, a reception-room, a supper-room, with the necessary serving-rooms, all of which will be in the main front in Church-street. On the corner of Church-street and Tisbury-road there will be a post-office, with a sorting-room. In the Norton-road side offices will be provided for the rate-collector, and a room for the sanitary inspector. On this side also will be the entrance to the police-court, and here the police-offices will be situated, including rooms for the chief superintendent, the police-clerk, and a charge-room, with a flight of steps leading down to the basement, where five cells will be provided, together with a lost-property room and a mortuary, with lavatories, and water-closets. In the basement, on the Tisbury-road side, and under the great hall, there will be a place for the fire-engine and a muster-room for the fire brigade. The remainder of the basement space will be allotted to store-rooms, places for the keeping of the water-carts, and so forth. On the first-floor of the south front will be a private room for the magistrates, a room for the magistrates' clerk, and a spare room for the committee, and a Board and committee rooms and offices. Adjoining these will be the Commissioners' committee-room, a public and a private room. On the Norton-road side will be the Police-court and solicitors' room at the back. From the first-floor corridor there will be an entrance to the galleries of the great hall, which are continued along three sides of the hall. On the second floor will be the kitchens and conveniences for the supply of the supper-rooms, and living-apartments for the hall-keeper. The whole building will be warmed by means of Leeds's American system of steam-pipes. The whole façade will be of red brick, with terra-cotta dressings. The main entrance, which will be an arched doorway, in keeping with the style of the building, will be sheltered by a porch reaching across the footpath to the kerb-stone. The front windows will be of two lights, except those in the wings, which will be of three lights, with cusped edges, and dormer-topped. The bricks are being supplied by Mr. Johnson, of Ditchling, and the terra-cotta by Mr. Edwards, of Ruabon. Internally, the general finishing will be pitch-pine woodwork, except the police-court, which will have oak wainscoting. The stair-treads will be supplied by Messrs. Hart & Peard, and will be a combination of iron and wood, to resist wear. The builder is Mr. John Thomas Chappell, of Pimlico, who is represented on the works by Messrs. Reed & Winter. Mr. E. C. Morgan is clerk of the works. The building is expected to be completed by the end of next year.

Hove, at the commencement of the century a fishing village of 100 inhabitants, has now a population of 18,000, with a rateable value of 184,152*l*.

THE WORSHIPFUL COMPANY OF PAINTERS.

UNDER the title "Some Account of the Worshipful Company of Painters, otherwise Painter-Stainers," Mr. John G. Crace, the present Master, has written and printed an interesting *brochure*, which tends to show especially that the Company represented the arts and artists of England down to the foundation of the Royal Academy. We will avail ourselves of some of his facts.

The Company is of considerable antiquity, a charter in which they are styled Peyntours having been granted in the sixth of King Edward IV., and they existed as a fraternity in the time of King Edward III. They were called Paynter-Stayners, because a picture on canvas was formerly called a stained cloth, as one on panel was called a table, probably from the French *tableau*. In the inventory of the pictures of King Henry VIII. we find them always so distinguished, as:—

"ITEM, *a table with the picture of the Lady Elizabeth her Grace.*"

"ITEM, *a stained Cloth with the picture of Charles the Emperor.*"

Strype tells us that, about 1575, "*the Peyntours Company found that their trade began to decay, by reason of other persons that had not been apprentices to it, who undertook painting. Whereby much slight work went off; as Pictures of the Queen, and Noblemen and others; which showed fair to sight; And the people bought the same being much deceived; for that such Pictures and works were not substantially wrought; A slander to the whole Company of Painters, and a great decay of Workmanship in the said Science; and also a great discouragement to divers forward young men very desirous to travel for knowledge in the same.*"

Here it will be seen the Company are referred to as wholly engaged in artistic work.

In the year 1575 they addressed Queen Elizabeth, that she would consider their cause, and give aid and assistance to them; and in 1581 Queen Elizabeth granted the Charter of Incorporation they now possess. It is addressed: "*Liberi Homines et Cives Civitatis London Artis sive Misterii pictorium vocant Anglice Paynters-Steyners.*"

The charter specially prohibits "*that any person, of whatever Estate or Degree, shall use or exercise the Arte or Mystery of the Paynter-Steyners, but only such persons as have been heretofore brought up and instructed by some one of the same Arte or Mystery as Apprentice in the same Arte for the term of seven years, under penaltie to forfeit the sum of five pounds.*"

The minute-books, which the Company still possess, commence from the year 1623. They prove how completely this Company was empowered to control and regulate the art of this country. One of their duties, frequently exer-

cised, was to search for work, to judge if it were well or ill done, and on many occasions to condemn it. On the 10th of March, 1673, there is a minute, "*That the Painter of Joseph and Pottifer's Wife and the Fowre Elements be fined 3l. 6s. 8d. for such bad work.*"

The Company were also applied to as arbitrators or judges of the value of artists' work, of which there is a remarkable instance, as shown in the minute dated January 11, 1631-2. They had received from the Lord Chamberlain a letter requesting them "*to view the Kings and Queene's New Barges, and to make a trewe valuation and Estimate of the Woorke done by Iohn De Cretz in panting trymming and gilding the said Barges;*" and this they did, making deduction from the account sent in by Iohn de Cretz.

From an early period down to the middle of the last century, the Painters' Company seems to have included the principal artists of England. In the reign of King Henry VIII., Sir John Browne, John Hethe, and Andrew Wright, Sargeant Paynters to that king, were liverymen of this Company.

In 1647, "Mr. Peter Lilly" was made free, and on the 17th May, 1635, "*Mr. Inigo Jones, the King's Surveyor, was invited to dinner, and very lovingly came and dined with the companye.*"

On the 6th of April, 1676, "*Mr. Lilly is desired to paint the King's Picture.*"

In the year 1687 the invitations to the Feast of St. Luke were signed by Anthony Verrio and Sir Godfrey Kneller, with N. Shepherd and Ed. Polehampton. The various pictures in the possession of the Company, many of them of considerable merit, are by artists, Liverymen of the Company. Sir James Thornhill was on the Livery, and Charles Catton, one of the founders of the Royal Academy of Arts, was Master in 1761.

There is no record showing what the old Painters' Hall was like. The following minute, dated April 2nd, 1630, may be usefully quoted:—

"*It is fully ordered and agreed that the Wanskotting and beautifying of the Hall shall presently be set in hand.*" . . . "*For the furtherance of which works there was this day presented to this Court a forme and patterns drawn by the care and paynes of Mr. Poule Isaacson which this Court with general good liking approved of.*"

The old Hall was consumed in the Great Fire of London.

On December 20th, 1668, there is a minute as follows:—

"*At a Committee for rebuilding the Hall, Mr. Bird, Master, Mr. Savile, Mr. John Bird, and Mr. Evans—*

Mr. Luck the Bricklayer appeared and agreed to do all the bricklayers work belonging to the Hall for fifty-four shillings the rod, he to find Lime and Sand and to use all the old bricks on the ground.

Mr. Bell the Carpenter appeared and contracted to build the Hall and Front House burnt lately, for 50l. a square upon the flatt, he agreed to employ Mr. Luck the Bricklayer and to pay him thirty and eight shillings a rod for workmanship."

In concluding his account, Mr. Crace points out that the Painters' Company, though they receive and pay away in charity large bequests yearly, have very limited Corporate funds. They are, however, desirous of exercising to the best of their ability the influence of their Guild for the advancement of the art they represent. They were the first of the City Companies to open an Exhibition of Works of Decorative Art, recorded in our pages years ago. They now propose from time to time to give lectures suitable for the technical education of young men in Industrial Art; and they are endeavouring to open an intercourse with the working men, which they trust may be attended with useful results.

The Melbourne Exhibition.—At a meeting of British exhibitors, held in the Garden Palace, Sydney, on the 5th day of April, it was unanimously decided that it was desirable that a specially appointed British Commissioner should be sent out from London by the English Government to watch over the interests of British exhibitors during the International Exhibition to be held in Melbourne in October next. Sir Philip Cunliffe Owen was mentioned as being particularly qualified for the appointment on account of his experience gained at previous International Exhibitions.

PARLIAMENTARY JOTTINGS.

The Ordnance Survey.—In the House of Commons, on the 20th inst., Mr. Hopwood (on behalf of Sir H. Jackson) gave notice of his intention, on Friday, June 4, to call attention to the present position of the Ordnance Survey of Great Britain, and the desirability, in order to afford increased facilities for the transfer of land, of the immediate completion of that survey, and to move a resolution.

Inhabited House Duty.—Mr. Hubbard has obtained leave to introduce a Bill to amend the administration of the Inhabited House Duty.

Metropolitan Water Supply.—In the House of Commons, on Monday last, Mr. Ritchie asked whether the Government proposed to deal with the question of the metropolitan water supply within the present Session, and, if so, when a proposition on the subject would be laid before the House. The Prime Minister asked the hon. member to postpone this question for three or four days.

Convict Labour.—Sir H. Drummond Wolff asked the Secretary of State for War whether the foundations of the residence of the Lieutenant-Governor of Portsmouth had been prepared by convict labour; and whether he could state to the House the comparative cost of convict labour and free labour. Mr. Childers, in reply, said convict labour had been employed at Portsmouth in connexion with the War Department and Naval Department for many years. The foundations of the Governor's new house were commenced some months ago, and it was then decided to detail a certain number of convicts for it.

Employers' Liability.—Mr. Dodson, President of the Local Government Board, has brought in a Bill to extend and regulate the liabilities of employers to make compensation for personal injuries suffered by persons in their service. The Bill proposes in the following cases to confer on workmen, their wives, children, or legal representatives, the same right to compensation against their employer as if they had not been in his service or engaged in his work:—Firstly, where personal injury is caused to a workman "by reason of defective works, machinery, plant, or stock connected with the employer's business." Secondly, where the injury is due to "the negligence of any person in the employer's service who has superintendence entrusted to him." Thirdly, where the negligence is on the part of "any person in the employer's service to whose orders or directions the workman is bound to conform." And, fourthly, where the injury arises from "the act or omission of any person in the employer's service done or made in obedience to the employer's rules or bye-laws, or in obedience to instructions given by any person delegated with the employer's authority on that behalf." The Bill exempts from its operation cases where the workman injured "materially contributes by his own negligence to the cause of his injury." If the compensation claimed by a workman does not exceed 200*l.* the action is to be brought in a County Court, and for the purpose of ascertaining the amount to be awarded it is provided that assessors may be appointed by the Court. ——In the House of Lords, on Monday, Earl de la Warr introduced and moved the first reading of a Bill relative to the liability of employers for compensation for injuries to their servants. The noble earl said it was substantially the same as the Bill he introduced in the last Parliament. —— The Lord Chancellor said the Government had adopted either wholly or substantially Mr. Brassey's Bill on this subject, and had already introduced it in the House of Commons. He therefore trusted that his noble friend would not think it necessary to proceed further than the first reading of his Bill till that of the Government came up to their lordships' House.——Earl de la Warr expressed himself ready to act on this suggestion, and the Bill was then read a first time.

Ancient Monuments.—In the House of Commons on Tuesday, Earl Percy moved for the appointment of a select committee to inquire into the number, situation, and condition of the various ancient British, Celtic, Roman, Danish, or Saxon monuments in the United Kingdom which are of interest from a scientific or antiquarian point of view, and to report what legislative measures are necessary for their preservation. The motion was seconded by Mr. Whitwell, and both gentlemen urged that such an inquiry would facilitate the passage of a satisfactory Ancient Monuments Bill. Mr. A. Peel, on behalf of the Government, opposed the inquiry as unnecessary, pointing out that the schedules of Sir J. Lubbock's Bill, in which all the public monuments to be preserved were enumerated, had already been very carefully considered by a select committee and the Society of Antiquaries. Mr. Baring also opposed the motion, and Mr. O. Morgan, on the same side, pointed out that the Bill had been eleven times before the house. Mr. C. Bentinck, Mr. Beresford-Hope, and Mr. M. Stewart spoke in favour of the motion. A motion for the adjournment of the debate was carried, on a division, by 177 to 78.

SEWAGE UTILISATION.

Birmingham.—At a meeting of the Birmingham Tame and Rea District Drainage Board, held on the 11th inst., at the Council House, under the presidency of Alderman Avery, the chairman, in pursuance of notice, moved a resolution referring it to the Works Committee to consider the arrangements to be made for acquiring additional land for the more effectual treatment and purification of the sewage of the United Drainage district. He referred to the rejection of the Birmingham Sewage Bill, nine years ago, by a narrow majority in the House of Commons, after having been favourably reported upon by a Select Committee, and said that the Sewage Committee, not discouraged, adopted all the means that were at their command. They acquired by agreement about 100 to 120 acres of land instead of the 800 acres proposed to be acquired by the Bill. They also constructed an extensive system of tanks, designed by Mr. Hawksley; they discovered a system of digging in the sludge which from that time to this had been carried on with remarkable success; and though the Bill had been deprived of an essential part, viz., the acquisition of land, and though so large a sum as 12,000*l.* had been fruitlessly expended in endeavouring to obtain that Bill, besides months of labour equally fruitless and unavailing, the committee adopted all such means as were at their disposal, and had achieved what might fairly be called a very considerable and substantial measure of success. The scheme adopted by the committee was of a composite character, embracing the most conspicuous characteristics of different schemes. It was based upon these principles:—1st, the application of lime, by which the metallic acids mixed with the sewage would be neutralised; 2nd, the construction of an extensive system of tanks for the purpose of arresting the matters in suspension contained in the sewage; and 3rd, the acquisition of such an amount of land as would be sufficient for the ultimate purification of the sewage. Whereas 6,000 or 7,000 acres of land would be required to treat the sewage of Birmingham on the broad irrigation system, 800 acres would be sufficient (making due provision for the future increase of the population) under the system of treatment now being used. The resolution was unanimously adopted.

London.—On the recommendation of the Works Committee, the Metropolitan Board of Works has agreed to grant the application of Scott's Sewage Company for permission to make a small trial of their process for treating sewage at the Crossness Pumping Station, upon the conditions stated in the application, and subject to such trial being carried out under the supervision of the engineer of the Board, and at the sole cost of the company. Mr. Dresser-Rogers, in proposing the adoption of the report, observed that Major-General Scott was a gentleman who had given a large amount of attention to this subject, and the committee, while not pledging the Board to anything in the matter, thought the company might be allowed to try this experiment at their own cost.

Salisbury. — The Salisbury Town Council recently asked the Local Government Board to grant a provisional order enabling them to acquire certain land compulsorily for the purpose of disposing of and utilising the city sewage by the formation of a sewage farm. Captain Hildyard, on behalf of the Board, has inspected the proposed site of the sewage farm, and he deems it unsuitable for the object intended.

Gustave Charpentier, a pupil of Ingres, died recently.

PROVINCIAL NEWS.

Brighton.—Another step towards putting into force in Brighton the provisions of the Artisans' Dwellings Act was taken by the Town Council on the 5th inst., when the town clerk was instructed to ascertain the names of the owners and lessees of the various properties proposed to be dealt with, and to take all the necessary steps prior to presenting a petition to the Local Government Board for their sanction to the scheme, which is estimated to cost upwards of 70,000*l.* The scheme, whatever modifications may be made in it by the Local Government Board, will sweep away a group of streets which (says the *Brighton Herald*) have long been a by-word and a reproach, by reason of the vice and filth that they harbour.

Manchester.—The new dispensary for out-patients of the Royal Infirmary was opened on the 11th inst. The new building is connected with the Infirmary by means of a narrow corridor, and fronts Parker-street. It has cost about 4,500*l.*, and has been erected from designs by Messrs. Pennington & Bridgen, architects, by Mr. Southern, contractor, Salford. Entering by a vestibule (24 ft. by 16 ft.), in which the new patients will be seated while waiting for their cards and books, the large waiting-hall is reached. This compartment (50 ft. by 38 ft.) is lighted with a large ventilating dome, 24 ft. diameter. One part of the room is reserved for those who require medical, and the other for those needing surgical, treatment. On each side are the consulting-rooms into which the patients will be conducted. There are twelve of these, and they are supplied with ante-rooms for dressing, &c. At the extremity of the hall is the dispensary proper, where the patients (who number about 300 daily) will receive the prescribed medicines or drugs.

Workington.—A start has been made with the sewer extensions and improvements at the lower end of the town, Messrs. Lowthian & Taylor having been entrusted with the work. Mr. Whitfield is engaged in the erection of new houses on the ground facing Station-road, and a number of dwellings are in course of erection in Senhouse-place, which will soon become a street 36 ft. wide. Adjoining Belle Isle-place, Mr. Whitfield is erecting a terrace of better-class dwelling-houses, fronting into Station-road. New houses are being rapidly completed near to Lawrence-street and Havelock-terrace. Large blocks of ground are also being built upon in continuation of John-street and Peter-street, building sites now being taken up to the margin of the Tarn.

Glastonbury.—There is work in prospect for builders in Glastonbury. Mr. James Austin, of the Abbey, the largest property owner in the place, has laid out one of his fields for building purposes, and the ground has been staked out for the erection of fifty cottages or houses of small rental,—a class of dwellings much wanted in the borough.

Congleton.—Mr. Thomas Hughes, Q.C., has laid the corner-stone of the new central stores of the Congleton Industrial Co-operative Society. The site of the new buildings is situated in Mill-street, and the main building, which will be of a plain, substantial character, will have a frontage to the street of 86 ft., and will be 36 ft. deep. It will consist of a large meeting-room on the first floor, the other portions being devoted to shops and warehouses, while at the back are situated large and commodious bakehouses. The architect is Mr. James Brown, and the contract has been let to Mr. John Worrall, builder, the amount being 2,235*l.*

Dorchester.—New offices, dwellings, &c., are being erected for Messrs. Eldridge & Pope, at their new brewery, near the South-Western Station. The amount of the contract is 4,038*l.*

Foulness Island.—About three years ago, owing to a series of unusually high tides, accompanied by exceedingly boisterous weather, the sea-walls of Foulness Island, on the South Essex coast, were in several places greatly damaged, and much apprehension was felt relative to the safety of the island. The services of Messrs. Kinipple & Morris, engineers, were obtained, and steps were at once taken by Mr. C. C. Harvey, the marsh bailiff, not only for the reparation of the damage sustained, but for strengthening the walls to such an extent as to prevent, if possible, a recurrence of the danger. The works have since been carried out, and the walls are now considered impregnable. The population of the island is between 700 and 800.

THE METROPOLITAN BUILDING ACTS.

WALKER *v.* KIRK AND RANDALL: HAYMARKET STORES.

SIR,—Mr. Walker asks you to correct an error in your otherwise accurate report of this case. I have a copy of the shorthand writer's verbatim notes before me, and I find your condensed report was perfectly accurate; therefore, there is no error to correct.

The magistrate did not ask Mr. Walker to withdraw the summons, but distinctly dismissed it; whereupon I agreed, at Mr. Newton's suggestion, that all the contract-plans signed by Messrs. Kirk & Randall should be shown to Mr. Walker, although he has had every opportunity of seeing them, and indeed has seen them repeatedly. But this is not the question at issue. It is not the general drawings Mr. Walker wanted to have produced at his office, but the drawings of the internal ironwork and concrete floors. These I have always refused to submit to him, as the Building Act gives the District Surveyor no control over such work.

Mr. Walker, knowing this to be the case, endeavoured some time since to induce the Metropolitan Board of Works to take proceedings against this building as a dangerous structure, and tried in every way to prejudice the case before it came before the Board for consideration, even to bringing some members to see the work, and in my presence he explained to the Chairman of the Board that it was only by taking proceedings under the Dangerous Structures clauses of the Act that he would be able to exercise any control over the work.

When I tell you, Sir, that I had called to my assistance a well-known engineer, who has had probably more experience in work of this kind than any other, and that his design had been approved by some of the greatest authorities of the day, you may suppose I might well have treated Mr. Walker's opinion with indifference, and have awaited the issue with confidence; but as an act of deference and courtesy to the Metropolitan Board, I submitted the whole of the drawings to their engineer and architect, who examined and reported upon them, the result being that nothing beyond what was originally intended was suggested as being either necessary or desirable, and the Board was advised not to assist Mr. Walker.

After the collapse of these unwarrantable proceedings, the District Surveyor endeavoured by a quibble to raise the question anew by taking out a summons for neglect to give notice. You will be able to form an opinion of the necessity of this when I explain that the notice of the works was written out in his office, he himself supplying the foreman with certain particulars and allowing the work to proceed until the last girder was ready for hoisting before he discovered that he had not received legal notice.

Under the magistrate's advice, a supplemental notice was given, when the present proceedings were taken, with the result you know.

Mr. Walker may be very anxious to achieve a certain notoriety with regard to dangerous structures, and may even have satisfied himself that he is acting only from a sense of duty; but in either case it is doubtful whether he is justified in taking proceedings which are simply unnecessary and vexatious, as has been proved by the result in this case.

THOMAS VERITY.

SOCIETY FOR PHOTOGRAPHING RELICS OF OLD LONDON.

SIR,—Thanking you for your notice of the photographs of the Charter House, forming this year's issue of the Society, will you allow me to state, for the benefit of such of your readers as are interested in the subject, that any information as to the Society's publications will readily be given by me.

ALFRED MARKS,
Long Ditton, Surrey.

MASTERS AND MEN.

Liverpool.—At a meeting held on Saturday last the operative painters of Liverpool unanimously resolved that, as several of the employers had not acceded to the request for a return of the ½d. per hour,—a reduction made in March last,—they would not resume work. A number of the employers have consented to give the advance asked. The following resolution was passed at a meeting of the master painters held on Tuesday:—

"Resolved, that the master painters of Liverpool consider that the demand of the men for a rise of wages at four days' notice is opposed both to justice and common sense, and if such action were admitted it would tend to demoralise all trade relations: they, therefore, consider it their duty to resist any demand so put to the utmost of their power, and they look confidently to the public to support them in resistance to such unreasonable conduct on the part of the men."

Glasgow.—On the 19th inst. a general meeting of painters was held in the hall, Nelson-street, Glasgow. It was reported that the strike-roll had been reduced to forty-five men. During the four weeks they had been out on strike, 600 men had got work at the advanced rate, about 550 had got employment in the country, and forty-five men were still out of employment. The meeting agreed, after a long discussion, to adhere to their original demand,—viz., an advance from 6½d. to 7½d. per hour, and 6d. extra per day when two miles out of the city.

The Lancashire Cotton-strike has ended.

The Outrage in a Rotherham Brickyard.—On the 20th inst., at the Rotherham Borough Police Court, William Green and Thacker Green, father and son, were charged with damaging 20,000 bricks and tools. The bricks were the property of Mr. R. Kendal Evans, who owns a brickyard at Setwell Vale, Rotherham. Thacker Green was employed there until May 4th, when he was discharged. He was very much annoyed, and said, "I will do him one for it," but he did not state to whom he referred. On the morning of Sunday, the 16th inst., it was found that the bricks had been destroyed by having been trampled upon, and the boots belonging to both the prisoners, together with those worn by William Green's grandson, exactly corresponded with the footprints upon the bricks. A number of brickmakers' tools had been thrown upon some burning bricks and destroyed. Both unionists and non-unionists are employed at the brickyard, and this is supposed to have been a source of ill-feeling. The prisoners were committed for trial.

GAS JOTTINGS.

Manchester.—Mr. John West, of Maidstone, has been appointed chief engineer of the Manchester Corporation Gasworks, from amongst twenty-one applicants.

Thurso.—The new gasworks here are being rapidly pushed forward, so as to be ready for the supply of the town by the 1st of October.

Belfast.—The Belfast Gasworks, acquired by the Corporation in 1874, have recently undergone considerable extension and improvement. In the year preceding the acquisition of the works by the Corporation, the consumption amounted to 364,000,000 cubic feet, and it is now stated that, for the year ending the 30th of June next, the quantity will be upwards of 500,000,000 cubic feet.

CONTINENTAL ITEMS.

The Tuileries.—The Commission on the Tuileries question has decided, after consulting two architects, in favour of the restoration of the palace and its conversion into a museum.

Exhibitions.—On the 9th inst. there was opened at Düsseldorf an exhibition of the industrial products of the whole Rhine country of Westphalia, and of some of the neighbouring Departments.——A German exhibition of fine arts is also open in Düsseldorf. German artists have responded very zealously to the invitation of the administration of the German Artists' Association, a society which influences both Germany and Austria. Many artists of European fame are represented by works of the highest merit, about 1,600 pictures, drawings, and engravings, and eighty sculptures, being exhibited.——An exhibition of articles connected with the watch and clock trades will be open at Geneva during the latter part of May, June, and July.——An exhibition will be held in July at Perugia, under the sanction of the Italian Minister of Agriculture and Commerce, of agricultural machinery, in which prominence will be given to steam ploughing and cultivation.——In 1881 there will be one of the same character at Lucerne, while Germany will hold two in the next year:—one at Frankfort, of hides, skins, tanning, and fur trades; the other probably at Berlin, of all apparatus connected with baths and electric treatment of disease.

Congress on Hygiene.—Particulars of the arrangements for the international congress on hygiene, to be held in Turin early in August, have been issued. The conference is to last a week. The co-operation of the town officials has been readily given, and a grant of 10,000 francs has been voted towards meeting expenses. The Ministers of the Interior, of Foreign Affairs, and of Education have promised their assistance; the University and other bodies have announced their intention of throwing open their suites of rooms, museums, libraries, &c.; and the King has consented to become the patron. As at present arranged, the sections will be as follow:—1, general and international hygiene; 2, domestic hygiene; 3, professional hygiene; 4, hygiene of schools and of children; 5, hygiene applied to agriculture; 6, hygiene applied to industries; 7, veterinary hygiene; 8, naval and military hygiene; 9, safety appliances of all kinds; 10, chemistry, architecture, &c., applied to hygiene.

Church of the Sacred Heart, Montmartre.—The subscriptions for the Church of the Sacred Heart, on Montmartre, now amount to 8,247,963 francs, of which sum 6,975,398 francs have been already expended. The crypt will be opened, it is expected, next autumn. Interior and exterior views of this church, of which M. Abadie is the architect, have been published in the *Builder*.

A New Presbytery is in course of erection at Ormskirk. It is being carried out from the designs of Messrs. Pugin. Mr. Thomas Riding, of Ormskirk, is the contractor.

CHURCH-BUILDING NEWS.

Longstock.—A new parish church, in the village of Longstock, Hants, was consecrated on the 13th of May. The building has been erected from a design by Mr. William White, F.S.A., upon the site of the former church. It is built, in the main, of flint, with narrow bands of tiling at intervals, to serve as tie and bond, while the dressings are of Bath stone. It consists on plan of a nave, north aisle, chancel, organ-chamber, a north-west tower and spire, and a south-west porch. The style is Early English of a character bordering on the transition into Decorated. The roofs are of steep pitch, and covered with warm red tiling. The stone copings to the various gables have their apex stones surmounted by foliated stone crosses. The tower is square, and surmounted by a spire. Internally, the nave is divided from the north aisle by an arcade of three bays. The floors of the body of the church are laid with wood blocks in herring-bone pattern. The floors of the chancel and of the sanctuary are laid with encaustic tiles. The walls throughout the building inside are plastered, and the stonework, instead of being "dragged" to a fine surface, is merely batted over, and the tool-marks left showing upon all the plain faces. The chancel-arch springs from columns upon which are carved the lily and the rose respectively, and above, the heads of our Lord and the Virgin Mary, to whom the church will be dedicated. The roofs of the nave and aisle and of the chancel are of timber, canted, and of massive construction. Twelve hammer-beam angels are carved in various attitudes of devotion and adoration. They are the work of Mr. Harry Hems, who has also executed the whole of the stone-carving. The building will be warmed by the patent heating-apparatus of Messrs. Musgrave & Co., of Belfast. The contractor for the general works has been Mr. Hammett, of Andover.

Maidstone.—It is proposed to complete the tower of St. Faith's Church, and to provide additional vestry accommodation. The tower will be built from the designs of Mr. E. W. Stephens, architect, Maidstone, and will be a square one with four pinnacles, the total height of the structure being about 110 ft. The committee have accepted the tender of Messrs. Vaughan Bros. for the work, at the sum of 1,875*l.*

Buckland Brewer.—The parish church of Buckland Brewer, North Devon, has been re-opened, after restoration. The piscina in the old east wall of the chancel has been restored; a portion of the tower has been rebuilt, the pinnacles have been replaced, and a lightning conductor has been supplied. (The church had twice been seriously injured by lightning.) The area has been restored to its original form of nave and south aisle, the dividing arcade being of Bath stone columns; a new roof has been added, and raised to the same height as that of the structure of 1399; all the windows except that in the tower are new, and of Ham-hill stone; the tower arch has been thrown open to the nave, and the chancel has been extended 12 ft. eastward. The entire building has been seated with pitch-pine open seats. The doorway between the priests' vestry and the south aisle has been cleared of an accumulation of paint and whitewash. The key-stone of the arch was found to contain a sculptured figure, holding in either hand the moulding of vine-leaves which enriches the door-jamb on either side. This figure, by the royal order for the destruction of images in churches, had been chiselled away, but, by the wish of the vicar, the mutilated stone had been left to tell its own tale. The total cost will be about 1,500*l.* The contractors were Messrs. Petherick Bros., Hatherleigh; the architect being Mr. S. Hooper, of Hatherleigh.

Reading.—A committee has been appointed to carry out the restoration of the tower of St. Lawrence's Church, Reading, at a cost estimated by the architect consulted (Mr. Jos. Morris) at 1,300*l.* The tower is reported to be so dilapidated that in gusty weather heavy pieces of stone are detached, owing to the loosening of the mortar. The other portions of the church were restored in 1867.

Bristol.—On the 8th inst. the parish church of St. George's, near Bristol, was re-opened by Bishop Ellicott. The former church, which was erected in 1756, was in 1876 renovated and improved by the present vicar, the Rev. A. R. D. Flamsteed. The cost of the alteration had only just been defrayed when the fire took place. Mr. Philip E. Massy, of the firm of Norton & Massy, architects, London, furnished the plans for restoration gratuitously, and under his superintendence a building in the fourteenth-century style of architecture has now been erected by Messrs. Cowlin & Son, of Gloucester, at a cost of 6,000*l.* Practically, the outer walls and the lower stages of the tower are the only portions of the old church remaining. The building consists of nave, north and south aisles, and chancel and vestry; and, like the old structure, will accommodate about 600 worshippers. The old local stone of the destroyed church has been used, most of it being found available. A peal of six bells has been supplied by Messrs. Llewellyn & James, of Castle-green, and hung by Mr. York. The interior of the church throughout is paved with Minton's tiles. The new pulpit is of Bath stone from base to floor, with railing of ornamental ironwork. The font stands on two marble steps, and is made of Devonshire stone, with carved covering. The metal-work has been done by Mr. Leaver, of Maidenhead, and the whole of the carving by Mr. E. Sheppard, of Bristol.

Darrington.—Darrington Church, near Pontefract, was re-opened on the 14th inst., after restoration, at a cost of upwards of 2,000*l.*, under the direction of Mr. A. W. Blomfield, M.A., of London, the contractors being Messrs. Shillitoe & Morgan, Campsall, near Doncaster. The tower, which was in a shaky condition, has been restored and underpinned, and the church made perfectly dry by excavations all round.

Frodsham.—It has been decided to restore Frodsham parish church, at a cost of about 7,000*l.* Messrs. Bodley & Garner have prepared the necessary plans. It is proposed to take off the roof and the ceiling, remove the galleries and the present pews, throw open the tower, take down the south wall and reconstruct it, put on new roofs, and restore the pinnacles on the tower, and the arches in the north and south aisles. It is also proposed to put in a new floor and a heating apparatus, and to re-seat the church with oak benches, with the exception of that part of the church known as the Helsby Chapel, in which it is proposed to place chairs. The church will at present seat 1,050 persons, and when restored from 650 to 700.

Hawick.—The new parish church of St. John, Hawick, was formally opened on the 11th inst. The church, which is in the Early English style, has cost about 6,000*l.*, and is seated for 750 persons.

Southwell.—The work of restoration at the Minster is now progressing, a deal of scaffolding has been erected, and the old roof of the nave is being removed. Quantities of wood arrive every week, and there is a lead-smelting furnace on the ground.

Tolleshunt D'Arcy.—It is proposed to restore the parish church, and on the 10th inst. a special vestry meeting was called to consider the plans of the architect, Mr. Hayward, of Colchester, which were accepted, and Mr. Hayward was instructed to at once advertise for tenders for the carrying out of the work.

Steeple Bumpstead.—The parish church of Steeple Bumpstead, Essex, was re-opened on the 7th inst., after restoration at a cost of about 1,000*l.*, exclusive of the chancel, which has been restored by the Ecclesiastical Commissioners at an expenditure of 500*l.* The building consists of the chancel, nave, and aisle, with a fine Norman tower. Previously to the restoration the interior was occupied by clumsy high pews, which have now been replaced by open benches of pitch-pine.

SCHOOL BOARD SCHOOLS.

Hanley.—On the 10th inst. the chairman and members of the Hanley School Board opened the third school erected in their district, situate in Great York-street, Hanley. It provides accommodation for 800 children in three departments, viz.:—Infants, 300, on the 8 ft. basis, comprising main room, babies' room, and two class-rooms. The boys' and girls' departments provide sitting or desk space for 250 places, each distributed in a main room and three class-rooms. The various rooms throughout have the walls finished in plaster, with a dado 4 ft. high of Marsden's patent interlocking glazed tiles (supplied by Messrs. Mintons). The buildings externally are of a plain and substantial character, almost entirely executed in red brick of two tints, relieved with moulded bricks and terra cotta. The works have been carried out by Mr. J. Gallimore, contractor, Newcastle, from the designs and under the superintendence of Mr. W. A. Keates, the architect to the Board. The entire cost of the schools, together with the site, &c., gives an average of 6*l.* 19*s.* 2*d.* per head.

Kelso.—A new infants' school has been erected by the Kelso School Board. The building is of yellow freestone, bull-faced, and of a shape on plan representing the letter T. The rough aspect is here and there relieved by polished dressings, the corners, lintels, and other parts being of hewn stone. Accommodation is provided for 300 children, and the cost has been about 1,500*l.* The architects were Messrs. A. Herbertson & Sons, Galashiels; the contractors being:—For the mason work, Mr. John Bruce; joiner, Mr. Thomas Binnie; plumber, Mr. Thomas Macgregor; plasterer, Mr. J. Johnston; slater, Messrs. Wilson & Sons, Galashiels; painters, Messrs. T. & A. Russell; blacksmiths, Messrs. Hooper & Company.

VARIORUM.

THE June number of the *Magazine of Art* is distinguished as containing an article on "Queen Victoria and Art," illustrated, by the Queen's gracious permission, with copies of sketches by her Majesty and the Prince Consort. It cannot fail to be regarded with interest. The number is in other respects a good one; for its price, indeed, it must be called remarkable.——Mr. E. S. Roscoe has published, through Reeves & Turner, Chancery-lane, the case "Clemence *v.* Clarke," as an addendum to his valuable "Digest of Building Cases." It refers to the duties of architects, their certificates, and the arbitration clause in contracts, and is an important case.——Visitors to Burlington House will find "Academy Notes, 1880," edited by Henry Blackburne (Chatto & Windus, Piccadilly), an excellent reminder of what they have seen; kept from year to year, these "Notes" admit of useful comparisons. In the present issue a large number of the illustrations are from sketches supplied by the artists.——The *Athenæum* says,—Two volumes of Mr. Poynter's long-promised "Text-Books of Art Education" will shortly be published by Messrs. Sampson Low & Co. The first, which is on "Classic and Italian Painting," by Mr. Percy Head, contains an introductory preface on art-education by Mr. Poynter, who also contributes a chapter on Egyptian art, and succinct notices of the various Italian schools, with criticisms of their principal works. The other volume, on "Gothic and Renaissance Architecture," by Mr. Roger Smith, treats of the history of architecture from the rise of the Gothic style to the general depression which overtook the Renaissance style at the close of the eighteenth century.——"The Skin and its Troubles" is one of the "Health Primers" now in course of publication by Mr. D. Bogue. A wide circulation of it would do much good.——Mr. F. T. Dollman is about to publish by subscription forthwith, the drawings for the work being completed, "The Priory Church of St. Mary Overie, Southwark, generally known as the Parish Church of St. Saviour." It will include measured sketches and documents never before published.

Miscellanea.

An Engineer's Outstanding Account.—On the recommendation of the Finance Committee, the Metropolitan Board of Works has, after much discussion, resolved to pay an account sent in by Mr. C. H. Gregory, C.E., for professional services during the past eleven years, amounting to 1,039*l.* 10*s.* There appeared to be no doubt that the claim was a just one, the services specified having been rendered, but the question was raised whether the claim or a portion of it was not barred by the Statute of Limitations, and whether, if so, the Board would not be surcharged. It was urged that it would be a dishonourable course for the Board to evade its liabilities by pleading the statute. The solicitor of the Board having been appealed to, said that the payment of the claim would be perfectly legal, and that the auditor could not properly disallow the account. A few members of the Board, however, apprehensive of a surcharge, insisted on a division, when twenty-seven members voted for and four against the payment of the account. It was stated that the delay in sending in the account was owing to Mr. Gregory's absence from England from time to time, and to his ill-health.

Discovery of a Roman Villa.—The tesselated floors of several rooms of a Roman villa have recently been discovered at Morton's Farm, about half-way between Brading and Sandown. Mr. H. M. Westropp gives some particulars in the *Athenæum*. The floor of the principal room, which is about 16 ft. square, presents a most curious and interesting mosaic pavement in several compartments. In the centre, in a circular compartment, is a head of Dionysius, in his most youthful form, with flowing hair; by his side is a thyrsus. In one of the compartments is a most curious scene, which will doubtless give rise to much conjecture. On the left is a human figure, dressed in a tunic, with a cock's head, and, instead of feet, claws with a spur. He stands in presence of a small house, raised high, with a ladder up to it. On the right side are two winged animals, whether chimæræ, or dogs, or tigers, is doubtful. At the first glance, this cock-headed figure and these winged animals suggest a Gnostic and Mithraic origin. It cannot, however, be the Gnostic god Abraxas, as his characteristics were, besides the cock's head, serpent's legs, a lorica, and a shield. In the more probable view, as suggested by the Rev. C. W. King, it is a *jeu d'esprit* and nothing deeper, like the caricature scenes frequent in the Pompeiian wall-paintings. The pavement is composed of rather coarse tesseræ of only three colours,—black, white, and red. The black and white are made of stone, while the red are made of brick. Portions of wall-painting occur, one fragment bearing a little bird nicely painted. The room with the mosaic pavement is surrounded by other rooms, with a rude kind of tesselated pavement, the walls of which, about 1 ft. high, are still remaining. A coin of Gallienus was discovered, which would fix the date of the villa at about 263 A.D. The excavation deserves a visit from any one interested in such remains.

The Memorial to the late King of Hanover has been fixed in St. George's Chapel, Windsor, in a space between the Princess Charlotte's cenotaph and the north door. The order for the erection of the memorial was given by her Majesty to his Serene Highness Count Gleichen shortly after the interment of the late King of Hanover in St. George's Chapel. The portrait medallion of the king is surrounded by a wreath of poppies, emblematic of sleep, and it is surmounted by a group of seraphim. There is a figure of an angel on the left side, intended as an allegorical representation of pious resignation, while a corresponding figure on the opposite side represents peace for the faithful in the life hereafter. In the corners of the upper part of the framework are inserted the enamelled arms of the Queen and those of the Royal House of Hanover, and the small spandrels will be occupied by the white horse of Hanover when completed. The masonry is of Sicilian marble, and the sculpture and statuary are of Carrara.

New Vestry Hall at Bromley.—On the 21st inst. a new vestry-hall for the parish of Bromley St. Leonard's was formally opened by Mr. Churchwarden T. P. Langdon. The hall is situate in the High-street, Bow, a few yards westward of Bow Church, and faces the Bow station of the North London Railway. Since the beginning of this century the ground has been occupied by eight alms-houses, built under the will of Mrs. Bowrey. These houses were purchased by the parish, pulled down, and the present building erected on the site. The building is in the Italian style of architecture, and consists of two stories. The frontage to Bow High-street, is about 60 ft.; the building is faced with Portland stone, and is entered by a projecting portico. The foundation-stone of the building was laid on the 29th of May last year. The amount paid for the site was 2,600*l.*, and the cost of the building has been 6,500*l.*

Surveyor to the Goldsmiths' Company.—A correspondent writes,—I understand the following have been selected, from amongst whom the Court of the Worshipful Company of Goldsmiths, London, will proceed to elect a surveyor in the place of the late Mr. Robert Hesketh, viz.: T. Blashill, E. A. Grüning, G. Harrison, H. Parsons, J. W. Penfold, Norman Shaw, R. A., T. Roger Smith, and T. H. Watson.

Illustrations of the "Builder."—A bronze medal has been awarded to the Conductor of the *Builder*, by the jury at the Sydney Exhibition, for engravings published in this journal, under the head of "Architectural and Industrial Designs."

Ancient Remains.—At the last meeting of the British Archæological Association, a letter was read from the Rev. F. Smith, of Woodchester, reporting the intention of opening some of the magnificent pavements of the Roman villa there, if sufficient funds are available. These pavements are among the finest that have been found in England, and it is much to be regretted that they remain covered with earth. Funds are wanted for the work of uncovering, and for erecting a protecting building over them, that they may be always open to view. Any amount will be gladly received, if sent to the Rev. F. Smith, Woodchester; or to Mr. Loftus Brock, hon. sec. of the association. The discovery of a Roman villa at Castor was announced. It is about a quarter of a mile from the station, and a pavement of squared stone has already been opened. The first paper, read by the Rev. S. M. Mayhew, was descriptive of the remarkable Roman villa at Sandown, I.W., now being opened by Capt. Thorpe. Drawings of some of the pavements were shown, one being of great beauty. Capt. Thorpe has discovered the positions of two other buried villas at no great distance. The third paper was by Mr. C. W. Dymond, F.S.A., and was descriptive of the great British camp at Worlsbury, Weston-super-Mare. After giving details of the remarkable walls of rude stonework put together without mortar, the author proceeded to describe the approaches, and expressed a doubt as to the existence of the supposed platforms for slingers, a remarkable and unusual feature of the external defence, which has been pointed out, apparently erroneously, by former writers.

Fires at Builders'.—On Saturday afternoon a serious fire broke out on the premises of Messrs. Sutton & Dadley, builders, on the Surrey Gardens Estate, Walworth. The buildings where the fire commenced included three sheds, used for the storage of building materials and containing sawmills for the cutting of timber, and an engine-house and boiler-house. The fire broke out at about five o'clock, and the buildings were burnt out. Several stacks of timber were nearly destroyed. The fire caused damage to eighteen of the surrounding houses. ——On Sunday morning a fire broke out on the premises of Mr. Dadds, builder, in Mackell-road, Peckham, and a timber-shed building was nearly destroyed.——On Tuesday night, a serious fire broke out on the premises of Messrs. Wilson, timber merchants, Greek-street, Soho. A building of three floors, used as workshops and timber store, about 52 ft. by 12 ft., was completely burnt out, the roof was burnt off, and a quantity of timber in the yard was seriously damaged.——Much damage was done on Wednesday by a fire which broke out on premises between Williamson-street and Bridge-street, Luton, comprising a saw-mill and a range of carpenters' shops, amongst other property.

Royal Institution.—Mr. W. Spottiswoode, D.C.L., the president of the Royal Society, who has for a long time been studying, in conjunction with Mr. Moulton, some of the phenomena of electric discharges, gave the Friday evening discourse, last week, at the Royal Institution, on "Electricity *in transitu*." The Duke of Northumberland occupied the chair. It was stated that the aim of the investigations had been to endeavour to determine something of the duration of the small time-quantities of the phenomena,—that was, the times during which the different parts of the discharge are effected. The observations had been made on discharges within tubes of different states of exhaustion, but they were so transient, and so evanescent, that they eluded all direct observation, and it was only in relative results that anything had yet been done. The experiments were very interesting, and, in Royal Institution language, "everything behaved well." Deductions from them, however, at present are not obvious. These will come.

Florence.—A very fine *Exposition d'Orticulture* was opened here on Tuesday, the 18th inst. The rain on Wednesday, and the cold the next day, made all look very miserable. The ferns and leaf plants are very fine. The roses, though in an abundance not to be conceived, do not touch ours for variety. The calceolarias are remarkably fine for colour and form. Azaleas also, and geraniums are far below ours. Fruit, of course, is fine; lemons wonderful. At the same time, some specimens of good painting of flowers on looking-glass and mosaics, from the Royal Manufactory, are exhibited.

Accidents.—An inquest has been held at Runcorn as to the death of Thomas Warder, thirty-one years of age, who, while employed at the works of Messrs. Thomas Vickers & Sons, Widnes, in putting up a scaffold inside a drying-shed, fell to the ground, sustaining injuries which caused his death. Verdict: "Accidental death."——A very serious accident has happened to Mr. Joseph Chamberlain, builder, of Glastonbury. He has fallen from the roof of a three-story house, and has broken one of his legs and sustained other injuries.——On Saturday last, Coroner Dean held an inquest at Little Burn Colliery, Durham, as to the death of John Robinson, deputy overman, who had been crushed to death by the fall of a large stone about a ton in weight. No blame was attached to any one, and a verdict of "Accidental death" was returned.——On Saturday afternoon Mr. James Maddocks, of Peterchurch, near Hereford, was engaged with a man, named Ephraim Prosser, in deepening a disused well on Mr. Maddocks's property at Long-lane, near Peterchurch. There was a winding apparatus, and Mr. Maddocks went down in a bucket, Prosser following. Neither answering a signal, another man at the top went for Police-constable Dyke, who lived near, and he went down the well, but signalled immediately to be drawn up. When he arrived at the top he was much exhausted. Others came to the spot, and a nephew of Mr. Maddocks, who descended, was similarly affected. Other assistance arrived, and eventually Mr. Maddocks and Prosser were got out, the former being quite dead. The others are going on favourably. Foul air is supposed to have been the cause of death.——The upper portion of a new chimney-stack, 120 ft. high, which the Bristol Water Works Company were building at their spring at Chelsey, in Somerset, fell on Tuesday, about a ton of brickwork coming down. Some of it fell upon the contractor's foreman, named Hobbs, and on Mr. Briggs, the resident representative of the water company's engineers, Messrs. Taylor, Simpkins, & Co., of London. Hobbs was killed instantaneously, and Mr. Briggs was seriously injured.

Northern Architectural Association.—A meeting of the members of the Northern Architectural Association was held on the 25th inst., in the Old Castle, Newcastle, the president (Mr. Thomas Oliver) in the chair. Mr. Shewbrooks read a paper on "The Economy of House-building." Mr. Shewbrooks stated that the planning of a house was not that easy off-hand affair people outside of the profession seemed to consider, and he was convinced that good results could only be obtained by properly trained architects giving great attention to the subject. He described the leading points to be considered in the planning and building a mansion, and showed the great importance of every means being taken to keep out damp. The drainage should always be outside of a house, all waste pipes should be disconnected, and soil-pipes should be ventilated at the top and bottom, and kept away from windows. The best subsoil on which to build was gravel, and it formed the best foundation excepting rock; clay was not a good foundation.

Art in Liverpool and Manchester.—The ninth exhibition in connexion with the Liverpool Society of Water-colour Painters is now open. Between 120 and 130 members and associates of the society are represented by no fewer than 340 pictures, and the fullest capacity of the large room in the Royal Institution in Colquitt-street has this year been reached.—— In Manchester, the fourth of the series of annual exhibitions of works in black and white which have, for some years back, been held under the supervision of Mr. W. E. Hamer, was opened on Tuesday, at the Royal Institution, Mosley-street.

New Hospital at Twickenham.—On Tuesday afternoon the ceremony of opening a new hospital at Twickenham was performed by her Royal Highness the Duchess of Teck. The new institution has been erected and largely endowed by the munificence of Miss Twining. Mr. Edis is the architect, and Mr. Messom carried out the works.

A New Sunday Movement.—A new society, called "The Sunday Evening Association," has been formed, with the view of bringing together "all persons who, estimating highly the elevating influence of music, the sister arts, literature, and science, desire by means of meetings on Sunday evenings to see them more fully identified with the life of the people."

"**Germs,—Unseen Enemies,**" was the title of the third of the drawing-room series of lectures given at Hertford-street, Mayfair, under the auspices of the National Health Society. Professor E. Ray Lankester, F.R.S., was the lecturer. It seemed, he said, that heat is a certain destroyer of all germs, if it be of long continuance and of sufficient degree. Boiling is an undoubted means of effectually "sterilising" all *vibrios*. In some laudatory remarks on the antiseptic views of Professor Lister, Professor Lankester stated that a solution of carbolic acid, 1 in 20, will, if it be brought thoroughly into contact with germs, at once render them inert. The classification of these "unseen enemies" was, he allowed, not very perfect. It was at present only based upon the effects produced rather than on any special variety in their growth or appearance. Three varieties were described,—namely, those producing odours, those producing coloured products without odour, and those recognised as disease-producing germs. All bad smells, except those arising from chemical works and their products, were, he stated, due to the presence of *vibrios*. With regard to the disease-producing varieties, it was yet quite a matter of doubt whether (with the exception of two diseases—malignant pustule and splenic fever) the presence of the particular form of bacteria caused the disease, or whether it was not merely associated with the condition of the patient and the debilitated state of the system generally. The Professor, in the course of his lecture, suggested that it would be profitable, in the best sense, to establish laboratories and suitable opportunities for prosecuting original scientific research by competent professors into the many wide and important questions associated with the subject of the presence of unseen enemies in the daily life of our population.

Bristol Fine Arts Academy.—The annual meeting of the subscribers and friends of this institution was held on the 20th inst. The report stated that "the committee regret they have not so successful a result to announce to the subscribers as they could have wished. The lack of success applies especially to the falling off in the number of purchases made at the annual exhibition, the amount of profit realised being 52*l.* 12*s.* 4*d.*, as against 120*l.* 19*s.* 4*d.* of the previous year. The loan exhibition held during the months of October, November, and part of January, which consisted of pictures, lace, fans, textile fabrics, &c., was not well attended by the public." The statement of accounts shows that after payment of all demands the balance of profit carried to account is 33*l.* 3*s.* 3*d.* The attendance at the Life Academy shows a marked increase, in recognition of which the Committee granted an extra session to the students. It was resolved to recommend the committee to set apart one of their rooms "for the express purpose of exhibiting the pictures they already possess, with any that may be hereafter given them, believing that when this fact is made known our fellow-citizens will assist by their contributions in forming a collection worthy of the ancient city of Bristol."

The "Chalet" Company.—Under this title a company is being formed for providing public lavatories, retiring-rooms, and toilet accommodation, in the thoroughfares, squares, and other open spaces in the metropolis, and of the chief towns and cities throughout the United Kingdom, of an ornamental character, in the form of a Swiss "Châlet." The building, which is designed by Mr. A. Watkyns, is constructed of iron, wood, and brick, and is not displeasing in appearance. Arranged for the convenience of both sexes, the respective compartments are isolated by two lavatories, the entrances being at either end of the "Châlet." Something of the kind is urgently needed; the difficulty to be overcome is, of course, the provision of convenient sites.

The Dwellings of the Poor.—The Howard Association, having last week addressed the new Home Secretary on the urgent need for further legislative endeavours to diminish the excessive overcrowding of the poor in various districts, Sir William Harcourt has replied by a letter in which he states that "the subject will occupy a large share of my care and attention."

Messrs. Samuel Worssam & Co., of Oakley Works, King's-road, have received a high award for wood-working machinery at the Sydney Exhibition.

St. Etheldreda's Chapel and Austin Friars.—On Saturday last the members of the St. Paul's Ecclesiological Society visited the chapel of St. Etheldreda, in Ely-place, Holborn, and the church of the Austin Friars, near Old Broad-street. At Ely-place the construction of the chapel, which was formerly the private chapel of the Palace of the Bishops of Ely, was explained by Mr. John Young (the architect under whom the fabric has recently been restored), who discoursed on its early history and on its chief architectural features, its lofty oak roof, its magnificent eastern and western windows, full of geometrical and flowing tracery; its lofty side-lights, its ancient sculptures, and, lastly, its undercroft or crypt. At Austin Friars, the members heard a paper on that church read by Mr. George H. Birch, who contrasted its spacious nave and side aisles with the small and elegant chapel which they had just left. This arrangement, he said, was necessary for the purposes of the Augustine Friars, whose special mission it was to preach to large popular audiences. The nave and its isles, he said, were wider than those of some of our cathedrals; and the windows, which were of the Decorated style, had probably belonged to a more ancient fabric than the present. Mr. Birch drew attention to the elegant tracery of the southern windows, and to the sad havoc made in the church at the Reformation, when its beautiful central tower, transepts, and chancel were pulled down. Edward VI. gave the nave of the church,—all that is now left,—to the Dutch merchants of the Protestant faith, and their services had been held here for three centuries.

Ecclesiastical Art Exhibition.—As already announced, during the summer months an exhibition of artistic articles of an ecclesiastical character will be held on the Victoria Embankment (near the Chapel Royal, Savoy), and will be open to British and foreign art. The following are some of the leading classes into which the objects will be divided:—Pictures for churches, consisting of oil paintings, water-colour drawings, &c. (schools various); cartoons for wall-paintings, mosaics, &c.; architectural drawings; cartoons for stained glass; mosaics, sculpture, illuminations, stained glass, wood-carving, ivory-carving, &c.; bells, embroidery, tapestry, and textile fabrics, missals, heraldry and sacred symbolism, music, musical instruments, sacred books and vessels, metal work, tiles, frescoes, and mural decorations generally, models of churches (ancient and modern). The promoters are making arrangements for establishing technical ecclesiastical art-schools for both sexes.

Plymouth.—The "William Window" in the Plymouth Guildhall, the last of a series of fourteen illustrating local history, has just been completed by Messrs. Fouracre & Watson, of Stonehouse. It represents the interior of the old Tudor or Jacobean Guildhall. William Symons, the then mayor, is reading the proclamation of William of Orange as king, from such an ancient carved and canopied oaken bench as has still survived at Exeter, and more characteristically still, at Totnes, with a mullioned window behind, and above an antique candelabrum, a painting in a black frame, and the flags of the train bands. The window is the gift, as the inscription beneath testifies, of "J. Pethick, contractor for this building."

Conversazioni.—The President of the Royal Society has issued invitations for Wednesday, June 2nd, at Burlington House. Ladies are included.——The Council of the British Archæological Association will hold a *conversazione* in the Suffolk-street Galleries, on Tuesday evening, the 8th.—The Lord Mayor and Lady Mayoress have sent out cards for a *conversazione* at the Mansion House, on Friday, June 11th.

Views in Rome.—Mr. William Scott, travelling student in architecture of the Royal Academy, is about to publish by subscription a series of twelve etchings from nature of subjects including the Temple of Vesta, the Old Pescaria, the Cloisters of St. John Lateran, the Porta S. Paolo, and the Theatre of Marcellus. Messrs. Newman & Sons, Soho-square, will receive the names of subscribers.

Artists' Colours.—In reference to the lecture recently delivered by Mr. Holman Hunt on the quality and manufacture of artists' colours, it has been decided to convene a meeting at the Grosvenor Gallery for the discussion of this important subject. The date fixed for the meeting is Tuesday, June 8.

Mr. Albert Grant's House.—Purchasers have at last been found for the large house in the Kensington-road. A committee, acting for an intended new club, which is to consist chiefly of subscribers to Hurlingham, the Orleans, and other existing bodies, have agreed to give 195,000*l.* for the property. The sum of 100,000*l.* is to be paid at once, as caution money, and this is already in hand.

TENDERS

For the erection of Wesleyan Chapel at Old Ford, London. Mr. S. J. Newman, architect. Quantities supplied by Messrs. Curtis & Sons:—

	Chapel.	Fencing.	Iron windows*
Strong Bros.	£7,277	£ 69 5 0	£—
Cousens, King, & Co.	4,53[illegible]	107 0 0	—
Tyerman	4,403	85 0 0	—
Howell	4,384	70 0 0	60
Shapley	4,375	85 0 0	—
Cocks	4,343	80 0 0	40
Heath	4,340	—	—
Niblett	4,339	98 0 0	13
Dickinson	4,300	80 0 0	60
Higgs & Hill	4,220	88 0 0	40
Sharmer	4,194	72 0 0	19
Gregar	4,150	75 0 0	50
Hiskinbotham	4,140	63 0 0	10
Stevens & Bastow	4,099	79 0 0	40
Morter	4,029	63 0 0	5
W. & H. Castle	3,843	68 0 0	43
Harris & Wardrop	3,797	95 0 0	97
Crisp & Tomlin	3,773	67 14 0	20
Johnson	3,711	97 0 0	—
Judd	3,677	89 0 0	40
Ireson	3,614	75 0 0	16

* Deduct if iron windows are substituted for terra-cotta windows.

For the erection of two pairs of semi-detached houses, with fencing and road, at South Norwood. Mr. R. J. Paine, architect:—

	Houses.	Total.
King, Hornsey, N.	£2,950 0 0	£3,495 0 0
Hobbs, Croydon	2,949 10 2	3,355 9 2
Bowyer, Norwood	2,880 0 0	3,192 0 0
Hobern	2,780 0 0	3,175 0 0
Ormstead, Norwood	2,799 0 0	3,089 0 0

For new roads and sewers at East Acton:—

Bell	£1,994 13 0
Pizzey	1,430 0 0
Narraway	1,395 0 0
Nowell & Robson	1,380 0 0

For roads and sewers at Lee, Kent:—

Killingback	£1,750 0 0
Lansbery	1,615 0 0
Larrance	1,540 0 0
Pizzey	1,496 10 0

For road-making at Willesden:—

Keeble	£1,330 0 0
Dunmoor	994 0 0
Pizzey	939 10 0
Thompson	936 0 0
Harris	970 0 0
Wilson	934 0 0
Jackson	944 0 0
Killingback	895 0 0
Nowell & Robson	890 0 0
Mackenzie	880 0 0
Peal	830 0 0
Acock	815 0 0

For rebuilding No. 52, Ship-street, Brighton, for Messrs. Vallance, Catt, & Co. Messrs. Scott & Hyde, architects. Quantities by Mr. Frederick W. Hyde:—

Cheeseman & Co.	£910 0 0
Patching & Son	737 0 0
Parsons	730 0 0
Lesleyer	710 0 0

For erecting warehouses on the site of Nos. 14, 15, 16, 17, and 19, Heddon-street, Regent-street, for Mr. W. F. Williams. Mr. D. Cubitt Nichols, architect. Quantities by Mr. H. P. Foster:—

Cocks	£6,385 0 0
Grimwood	6,347 0 0
Little	5,798 0 0
Nightingale	5,671 0 0
Bywaters	5,575 0 0
Woodward	5,555 0 0
Langmead & Way	5,151 0 0
Conder	5,433 0 0
Hutchingson	5,395 0 0

For the erection of five shops and dwelling-houses, Booth-street, Spitalfields. Mr. G. Ferry, architect. Quantities supplied (to builders marked thus *) by Mr. Richard Peters:—

*Wheeler	£3,550 0 0
*Parrish	3,210 0 0
*Augood	2,990 0 0
Crabb	1,950 0 0

For the erection of a Wesleyan Chapel, at Twickenham, Middlesex. Mr. Charles Bell, architect. Quantities by Mr. H. Lovegrove:—

Williams	£1,190 0 0
Messom	1,147 0 0
Collinson	1,100 0 0
Adamson	1,093 0 0
Nye	1,089 0 0
Hiskinbotham (accepted)	925 0 0

For rebuilding warehouse, Philpot-lane, City. Mr. Charles Bell, architect. Quantities by Mr. H. Lovegrove:—

King & Son	£2,470 0 0
Smith	2,279 0 0
Thompson	2,174 0 0
Ashby & Horner	2,170 0 0
Woodward (accepted)	2,100 0 0

For alterations and additions to warehouse, York-road, King's-cross, for Messrs. McDougall Bros. Mr. Wm. Hudson, architect. Quantities supplied by Forge & Hudson:—

Hatton & Co.	£1,103 0 0
King & Son	915 0 0
Grey & Co.	875 0 0
Brass	835 0 0
Hill, Higgs, & Hill	824 0 0
Wilson & Hexton	8-8 0 0

For repairs at the Cat and Mutton, London-fields, Hackney, for Mr. Scott. Mr. Edward Brown, architect:—

Salt	£205 0 0
Thompson	199 0 0
Marr	174 0 0
Jarvis	145 0 0
Barrett	145 0 0
Wythe (accepted)	130 0 0

For the erection of four houses in the Vansittart-road, Forest-gate, for Mr. George Roberts. Mr. Edward Brown, architect:—

Marr	£1,072 0 0
Royal	936 0 0
Salt	895 0 0
Hawkins (accepted)	789 0 0

For the erection of six houses and shops at the corner of King's-road and Harriet-street, Fulham, for Mr. James J. Morgan. Messrs. Ebbetts & Cobb, architects. Quantities supplied by Messrs. Hodgson & Mundy:—

		Allow for old materials.
Steel Bros.	£6,900	£ 75
Mattock Bros.	6,891	110
Aitchison & Walker	6,682	35
Went & Perkins	6,591	113
Macey & Sons	6,575	40
Nightingale	6,381	50
Adamson & Sons	6,333	20
Longmire & Burge (too late)	6,150	60
Lathey Bros.	6,147	130
Braid & Co	6,100	25
Brass	5,984	100
Haylock	5,850	70

For villa residence at Prestatyn, near Rhyl, for Mr. W. H. Gilderoy. Mr. E. Worthington, architect:—

Williams & Profitt	£663 0 0
Prichard	559 0 0
Williams	470 0 0
Humphreys	467 0 0
Griffiths	465 0 0
Edwards (accepted)	453 0 0
Jones	450 0 0
For Masonry.	
Ellis	281 0 0
For Freestone only.	
Talace Stone Company	49 14 3

For new road on the estate of Mr. E. Heneage, M.P., in Cee, Great Grimsby. Mr. J. Henry Maughan (Messrs. Maughan & Curson), surveyor:—

Riggall & Havins	£288 15 0
Waller	288 0 0
Chapman	265 10 0
Brown (accepted)	250 0 0

For construction of roads and sewers on the Cotton estate, Shoot-up-hill, Hampstead. Mr. P. D. Tuckett, surveyor:—

Crockett	£4,334 0 0
Capper & Pound	4,244 0 0
Wall Bros.	3,810 0 0
Nowell & Robson	3.695 0 0
Watts	3,625 0 0
George	3,495 0 0
Kilungback	2,995 0 0

For the erection of a temporary building at Leicester for the purposes of the Church of England Congress, for the use of the Congress for the space of twenty-one days, then to revert to the contractor, who is to dispose and remove it within a stated time. Messrs. R. J. & J. Goodacre, architects. Quantities not supplied:—

Parnell & Son	£3,400 0 0
Bass	2,250 0 0
Hewitt	2,070 0 0
Ireson	1,990 0 0
Cox	1,500 0 0
Mason	1,474 10 0

For alterations, additions, and repairs, to the Sluice House public-house, Blackstock-road, Finsbury Park, for Mr. Lawrence. Mr. Fry, architect:—

Goodall	£1,996 0 0
Harper	1,733 0 0
Lister	1,610 0 0
Clarke (accepted)	1,050 0 0

For two houses in Park-ridings, Wood-green, for Messrs. T. G. & A. E. Rowe:—

Smith	£1,489 0 0
Boyce	1,393 0 0
Palmer	1,275 0 0
Mattock Bros.	1,253 0 0
Harper	1,250 0 0

For alterations and iron shutters to the Railway tavern, London-terrace, Crouch-hill, for Mr. Aysome. Mr. F. Chambers, architect:—

Grover	£364 0 0
Harper	333 0 0
Williams	296 0 0
Smith	232 0 0

For alteration and iron shutters to five shops, Findon-terrace, Crouch-hill, for Mr. C. Turner. Mr. F. Chambers, architect:—

Grover	£780 0 0
Williams	760 0 0
Smith	743 0 0
Harper	741 0 0

For a house in Whitethorn-street, Bromley, for Mr. G. W. Cowdell. Messrs. Hills & Fletcher, architects:—

White & Son	£275 0 0
Gunning (accepted)	249 0 0
Sills (withdrawn)	214 0 0

For alterations and additions to premises, Kingsland-road, for Dr. Towne:—

Seeley	£370 0 0
Thomerson	297 0 0
Taylor & Parfitt	294 0 0

For new warehouse in Bethnal-green-road, for Messrs. Hemming & Finch. Mr. Hemming, architect. Quantities not supplied:—

Downs	£1,637 0 0
Sharp & Mills	1,485 0 0
Taylor & Parfitt	1,379 0 0
Wall Bros.	1,300 0 0

Kensington Workhouse.—The alteration to lift wse for the Guardians of the Poor, St. Mary Abbott, Kensington (and not for the Metropolitan Asylums Board, as stated last week), the tender of Messrs. Bunnett & Co. being accepted.

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